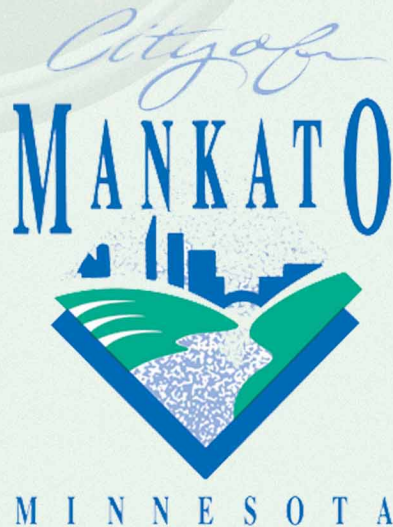


Northeast Industrial Service Area

Mankato, Minnesota

FINAL Alternative Urban Areawide Review

Prepared by:



August 2005

With Assistance From:



I&S Engineers & Architects, Inc.
One firm - start to finish

Project Number 05-8422

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ALTERNATIVE URBAN AREAWIDE REVIEW

This guidance has been prepared by the EQB staff to assist in the preparation of AUAR documents. It is based on the directive of 4410.3610, subp. 4 that “the content and format [of an AUAR document] must be similar to that of an EAW, but must provide for a level of analysis comparable to that of an EIS for impacts typical of urban residential, commercial warehousing, and light industrial development and associated infrastructure.”

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the AUAR in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

General Guidance

The AUAR guidance is based on the items of the standard EAW form (February 1999 version). Except where stated otherwise, the information requested is intended to augment (or clarify) the information asked for on the EAW form; therefore, the EAW form and the guidance booklet “EAW Guidelines” must be read along with the AUAR guidance.

The information requested must be supplied for each of the major development scenarios being analyzed, and it is important to clearly explain the differences in impacts between the various scenarios.

If this guidance indicates that an EAW item is not applicable to the AUAR, the item number and its title (the text in bold print on the EAW form) should be included with an indication that the EQB guidance indicates that no response is necessary in an AUAR (as opposed to just skipping reference to that item at all).

One general rule to keep in mind throughout the preparation of the AUAR document is that whenever a certain impact may or may not occur, depending on the exact design of future developments, the AUAR should cover the possible impacts through a “worst case scenario” analysis or else prevent the impacts through the provisions of the mitigation plan. Failure to cover possible impacts by one of these means risks the invalidation of the environmental review exemption for specific development projects.

The requirements on this document pertinent to the AUAR process are in *italics*.

Document format. If the RGU wishes to reorganize the AUAR content into a format other than that of the EAW form, it may do so, provided that a cross-reference index is supplied that informs the reader where the response(s) to each of the EAW items can be found (identifying the page(s) or specific section(s)).

1. Project title

Northeast Industrial Service Area

2. Proposer

City of Mankato (Developers to be Determined)
Contact person Paul Vogel
Title Community Development Director
Address PO Box 3368
City, state, ZIP Mankato, MN 56002-3368
Phone 507.387.8613
Fax 507.387.6845
E-mail pvogel@city.mankato.mn.us

3. RGU

City of Mankato¹
Contact person Paul Vogel
Title Community Development Director
Address PO Box 3368
City, state, ZIP Mankato, MN 56002-3368
Phone 507.387.8613
Fax 507.387.6845
E-mail pvogel@city.mankato.mn.us

¹Mankato Township has given the City of Mankato permission to act as the RGU for this Project. A joint resolution approving annexation is in the process of being approved by both the City of Mankato and Mankato Township.

4. Reason for EAW preparation

The EQB guidance indicates that this item is not applicable to an AUAR.

The City of Mankato has filed a Resolution (dated May 9, 2005) ordering the preparation of this AUAR (See Appendix A—Resolution to initiate the AUAR process), whereas the City of Mankato anticipates the development of land within a future growth area, and the City of Mankato has a Comprehensive Plan that includes the elements in items A to C of MN Rules 4410.3610 Alternative Urban Areawide Review Process, Subpart 1. Applicability, which allows the Local Government Unit (LGU) to use the procedures of this part to review anticipated residential, commercial, warehousing, and light industrial development and associated infrastructure in a particular geographic area within its jurisdiction.

5. Project location

County: Blue Earth County City/Township: Mankato (Mankato Twp)

 ¹/₄ ¹/₄ Section: 2, 3, 10, & 11 Township: 108N Range: 26W

Attach each of the following to the AUAR:

- *The country map is not needed for an AUAR.*
- *The USGS map should be included.*
- *Instead of a site plan, include:*
 - *a map clearly depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis;*
 - *land use and planning and zoning maps as required in conjunction with items 9 and 27; and*
 - *a cover type map as required for item 10.*
- *Additional maps may be included throughout the document wherever maps are useful for displaying relevant information.*

- Exhibit A. Location Map *(this is not needed according to the EQB guidance, but is provide as a reference)*
- Exhibit B. USGS Topography Map *(7.5 minute, 1:24,000 scale map indicating project boundaries)*
- Exhibit C. AUAR Boundary Map *(depict boundaries of the AUAR and any subdistricts used in the AUAR analysis)*
- Exhibit D. Existing Land Use Plan
- Exhibit E₁. Future Landuse Map Scenario A.
- Exhibit E₂. Future Landuse Map Scenario B.
- Exhibit F. Current Zoning Map
- Exhibit G. Cover Type Map

Additional maps have also been included to display relevant information:

- Exhibit H. Soil Type Map
- Exhibit I. Hydric Soils & NWI Map
- Exhibit J. Prime Farmland Map
- Exhibit K. Watershed Areas Map
- Exhibit L. Transportation Plan
- Exhibit M. Sanitary Sewer System Plan
- Exhibit N. Stormwater Management Plan
- Exhibit O. Water Supply System Plan
- Exhibit P. Private (Dry) Utilities Plan

6. Description

- a. Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

The City of Mankato, Minnesota is proposing a master plan for development called the Northeast Industrial Service Area. This will include the development of approximately 750 acres of predominantly agricultural landuse to a mix of industrial, commercial, and open space landuse over the next ten to fifteen years. This Project could include approximately 4,470,000 square feet of new building area and will require the extension of public infrastructure including water, sanitary sewer, roads and stormwater systems.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

Description. *Instead of the information called for on the form, the description section of an AUAR should include the following elements for each major development scenario included:*

- anticipated types and intensity (density) of residential and commercial/warehouse/light industrial development throughout the AUAR area;*
- infrastructure planned to serve development (roads, sewers, water, stormwater system, etc.) Roadways intended primarily to serve as adjoining land uses within an AUAR area are normally expected to be reviewed as part of an AUAR. More "arterial" types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are included, a more intensive level of review, generally including an analysis of alternative routes, is necessary;*
- information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule.*

The proposed development, Northeast Industrial Service Area (herein referred to as Project), will include a mix of industrial, commercial, and open space land use. The Project site is located in Sections 2, 3, 10 and 11 of Mankato Township, near the intersection of Hwy 14 and TH 22, just east of Mankato, in Blue Earth County, Minnesota (See Exhibit A—Location Map). The site is currently zoned agricultural. Once annexation is finalized, the entire Project will be located within the City of Mankato (herein referred to as the City). Development of this Project will include the construction of roads, stormwater drainage ponds, the extension of city water and sewer, and associated utilities.

The procedures for the Alternative Urban Areawide Review (AUAR) process are being used to study the Project instead of through an Environmental Assessment Worksheet (EAW) in order to review incremental impacts accumulating from a series of sequential projects. The AUAR process substitutes for an EAW or an EIS required for specific qualifying projects provided they comply with the review assumptions and mitigation measures. The review's key feature is that its subject is a development scenario or several scenarios for an entire geographical area rather than a specific project. These scenarios are established based on the comprehensive plan, zoning ordinances, developers' plans, and other relevant information.

The Land use of the Project is mainly focused on industrial land use. The boundary of the study area can be found in Exhibit C—AUAR Boundary Map which includes approximately 750 acres. Two land use scenarios have been included as part of the review. Land Use Scenario A (See Exhibit E1—Future Land Use Scenario A) includes a higher acreage of industrial use. The purpose of focusing on all industrial land use in one of the scenarios is to plan and identify the 'worst case scenario' in terms of impact to land use. The second Land Use Scenario B (See Exhibit E2—Future Land Use Scenario B) is included to correspond with the existing land use plan which identifies part of Project as commercial use. Commercial land use has been included and is used to plan and identify the 'worst case scenario' in terms of impacts to traffic, noise, and air quality from the higher number of vehicles usually associated with commercial use. The commercial portion of the land use scenarios is the only difference between the two scenarios. Both scenarios are mainly projected for industrial land use. Portions of the Project area are identified for open space. These open spaces are set aside for regional stormwater areas, community parks, and wetland preservation. The design of the parks, open spaces, and proposed trails will eventually link with future surrounding trails and developments. There is a large area of wetland complexes within the Project boundary that are protected by Minnesota Department of Transportation (MnDOT) easements. This area has been identified and set aside and is forecasted for preservation throughout development of the Project area.

The estimated number and type of proposed development units for the Project, as outlined in Exhibit E1—Future Landuse Scenario A and Exhibit E2—Future Landuse Scenario B, is provided in the following table:

Table 6-1. Proposed Land Use Development

SUB-DISTRICT AREA	SCENARIO A. ESTIMATED UNITS			SCENARIO B. ESTIMATED UNITS		
	Proposed Land Use	Acres	Gross Square Feet	Proposed Land Use	Acres	Gross Square Feet
A.	Industrial	53	415,563 gross sq ft ¹	Commercial	98	640,332 gross sq ft
B.	Industrial	112	876,170	Industrial	67	525,334
C.	Industrial	28	219,543	Industrial	28	219,543
D.	Industrial	54 ²	—	Industrial	54	—
E.	Industrial	80	627,264	Industrial	80	627,264
F.	Industrial	157	1,231,005	Industrial	157	1,231,005
G.	Industrial	80 ³	627,264	Industrial	80	627,264
H.	Industrial	60	470,448	Industrial	60	470,448
I.	Open Space	70	—	Open Space	70	—
TOTAL			4,467,257 gross sq ft			4,341,190 gross sq ft

¹ These numbers are derived from the total amount of square footage available based on the total number of acres, multiplied by the Floor Area Ratio (FAR) used in the 2003 Mankato Area Transportation and Planning Study (MATAPS). The FAR used for industrial landuse is 0.18 and the FAR used for commercial landuse is 0.15.

² 54 acres has been projected for industrial land use for regional stormwater ponding, wetland restoration or creation area, and possible future road extension. It is assumed that approximately one-third of the total acreage of the three areas in the 'Potential Sensitive Resource Area' overlay zone will be utilized as open space, equaling approximately 54 acres. The possible extension of CSAH 12 may also affect these sub-district, therefore the 54 acres in subsection D has not been given a total for gross square feet.

³ The acreage given in this column is the total area and not what is actually developable. Sub-district G includes a large amount of wetland area, gas pipeline easements, and may include the extension of CSAH 12, which would decrease the amount of developable acres.

As stated earlier, the only significant difference between the two development scenarios is Sub-district A. Scenario A shows this sub-district as Industrial and Scenario B shows this area as Commercial. The City is aware that in order for this AUAR to remain valid as a substitute form of review, the environmental analysis document and the plan for mitigation must be revised if five years have passed since the City adopted the original environmental analysis document and plan for mitigation. Since the projected timeline for the extension of CSAH 12 is greater than 5 years and is only in the conceptual stage of planning, the City is aware this AUAR document will most likely need to be updated.

The Mankato Land Use Plan (Updated April 2005) identifies future industrial and commercial use surrounding the Project on the north and south, with agricultural preservation area to the east, adjacent to the Project site. The Project is compatible with existing and proposed adjacent land uses.

Development of this site will involve modifications to the original topography to accommodate the construction of roads, commercial, and industrial development, parks and trails, municipal sewer and water, utilities and stormwater management facilities. The main equipment for grading the site will be bulldozers, scrapers, compactors, excavators, and other standard earth-moving equipment. The sequence of construction will follow standard practices for conventional land modification for developments. The construction activities will begin with the installation of erosion control measures, followed by overall site grading and road construction, construction of the stormwater management systems, installation of municipal sewer and water, the installation of utility services such as natural gas, cable, telephone lines, and end with the establishment of a permanent vegetative cover. Additional land disturbances such as custom grading operations are expected as development is constructed on the individual parcels. Erosion control and turf establishment controls for individual lot construction is required as part of the City of Mankato's building permit and the MPCA Stormwater Permit.

The City of Mankato has previously conducted a sanitary sewer study and developed a Sanitary Sewer Plan to consider the needs of the city and to address corresponding cumulative issues. The plan will be used to plan the orderly expansion of wastewater collection facilities in the Project

area. The plan delineates the location of future sewer extensions, forcemains, and lift stations to service future growth areas. Wastewater generated within the Project will be collected in proposed gravity sewer lines with sufficient depth to serve the development, the existing lift station along TH 22, and existing forcemains and gravity sewerlines to serve future growth areas.

The City of Mankato has previously conducted a water supply study and has developed a plan to address the future demands of the city and also addresses corresponding cumulative issues. Development at the site will utilize the City of Mankato's public water supply. The City's water system includes municipal wells, storage tanks/towers, and treatment facilities. Preliminary calculations and discussions with the City Engineer indicated the City's water supply system has the capacity to meet the needs of the Project. However, based on the future anticipated growth of the Mankato area, it is likely the City will need to amend their DNR permit to provide for anticipated growth of the Mankato area in addition to the Project, prior to the year 2025, or before the Project area is fully developed. The City of Mankato is in the process of improving their water supply system with the addition of two new wells. Wells no. 15 and 16 are scheduled to be constructed in 2005. Well no. 15 is an additional Ranney vertical cassion with horizontal collector laterals. Well no. 16 is anticipated 710 feet deep and will draw water from the Mount Simon Hinckley aquifer.

Stormwater management basins will be finalized during the preliminary plat. The basins will be designed for adequate settling to reduce phosphorous and sediment loads. The layout will be the determining factor in the number of stormwater basins required. Each stormwater basin will be constructed to MPCA and the City's standards to treat stormwater runoff. The stormwater treatment facilities will be designed to reduce peak flow rates from existing conditions to pre-development conditions and reduce sedimentation, thus increasing the quality of water draining from the Project site. Designing and constructing stormwater treatment facilities to achieve the rate reduction goals will provide a responsible stormwater management system.

Road construction and improvements will occur as a result of this Project. New internal road alignments have been determined for future Technology Drive extension, future Power Drive and future Sohler Drive (See Exhibit L—Transportation Plan). Additional roads will be necessary, but the final layout and locations have not been determined. CSAH 3 will be improved to accommodate increased traffic due to the construction of this project. CSAH 12 will eventually be extended through the Project area intersecting with US 14 and continuing south as part of the mitigation plan to accommodate future growth to the area and the additional traffic this Project will produce once fully constructed.

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of this Project is intended to provide a proactive master plan for a large area that will be used primarily for industrial development. The AUAR process is being used to study this area in order to review incremental impacts accumulating from a series of sequential projects. This study focuses on development scenarios for an entire geographical area rather than a specific project. These scenarios were established based on the comprehensive plan, zoning ordinances and prospective development projects.

This project will be carried out by the City of Mankato and approval for development within the Project boundary will come from the City. There is an active real estate market and a steady demand for land in and adjacent to Mankato. Beneficiaries of the Project will be the City, land owners within the Project vicinity, developers, and commercial and industrial companies purchasing lots.

d. Are future stages of this development including development on any outlots planned or likely to happen?
☒ Yes ☐ No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

All development anticipated and proposed to occur is described and analyzed in this AUAR. The Project is proposed in response to anticipated future regional growth as a regional center in South Central Minnesota. This question is being answered 'yes' because the entire development of the AUAR area is anticipated to occur in phases over a 10- to 15-year (or greater) period. New infrastructure and improvements to the existing infrastructure will be needed to accommodate future developments. The City of Mankato has undergone intense comprehensive land use planning for anticipated growth. The purpose of this Project is to take a proactive approach to planning and development in the area. It is anticipated that development will begin in 2005 and be phased over the next 10- to 15-years. However, the final development schedule will depend on market conditions. As public infrastructure is extended to this area, development will progress. Stages of development for this study area are outlined in the table below:

Table 6-2. General Development Schedule

PHASE	TIMEFRAME	GENERAL DEVELOPMENT
Pre-development	Fall 2005 – Spring 2006	Utility Extensions and CSAH 3 Improvement
Phase I	2006-2008	Development of Land Area F
Phase 2+	2009-2025	Development of Remaining Area

Individual projects within this area will not be subject to individual environmental reviews if designers conform to AUAR assumptions and mitigation plan requirements. Failure to conform exposes the individual projects to additional time delays and expenses, thereby encouraging projects to be designed in an environmentally conscientious manner. Regardless of any significant changes not encompassed by this review, the review must be updated every five years until all development in the area has been approved. Revisions to the documents are distributed for review in the same manner as for a final AUAR document.

According to Subpart 7 Updating the review, MN Rules 4410.3610, the environmental analysis document and the plan for mitigation must be revised if any of the circumstances in the following items apply:

- Five years have passed since the City adopted the original environmental analysis document and plan for mitigation or the latest revision. This item does not apply if all development within the area has been given final approval by the City.
- A comprehensive plan amendment is proposed that would allow an increase in development over the levels assumed in the environmental analysis document.
- Total development within the area would exceed the maximum levels assumed in the environmental analysis document.
- Development within any subarea delineated in the environmental analysis document would exceed the maximum levels assumed for that subarea in the document.
- A substantial change is proposed in public facilities intended to service development in the area that may result in increased adverse impacts on the environment.
- Development or construction of public facilities will occur on a schedule other than that assumed in the environmental analysis document or plan for mitigation so as to substantially increase the likelihood or magnitude of potential adverse environmental impacts or to substantially postpone the implementation of identified mitigation measures.
- New information demonstrates that important assumptions or background conditions used in the analysis presented in the environmental analysis document are substantially in error and that environmental impacts have consequently been substantially underestimated.
- The City determines that other substantial changes have occurred that may affect the potential for, or magnitude of, adverse environmental impacts.

e. Is this project a subsequent stage of an earlier project? Yes ✓ No
If yes, briefly describe the past development, timeline and any past environmental review.

7. Project magnitude data

Project magnitude data. The cumulative totals of the parameters called for should be given for each major development scenario, except that information on “manufacturing,” “other industrial,” “institutional,” and “agricultural.”

No changes from the EAW form, except that the information should be given for each major development scenario.

Total project acreage: ~750

Land Use Scenario A.

Number of residential units: unattached: 0 attached: 0 maximum units per building: 0
Commercial, industrial or institutional building area (gross floor space): total square feet: ~4,467,257

Indicate areas of specific uses (in square feet):

Office: <u>n/a</u>	Manufacturing: <u>n/a</u>
Retail: <u>n/a</u>	Other industrial: <u>~4,467,257 sq ft¹</u>
Warehouse: <u>n/a</u>	Institutional: <u>none</u>
Light industrial: <u>n/a</u>	Agricultural: <u>none</u>
Other commercial (specify): <u>Land Use Scenario A does not include commercial land use</u>	
Building height: <u>no restrictions²</u> If over 2 stories, compare to heights of nearby buildings: <u> </u>	

¹The types of Industrial use, whether it is warehouse, light industrial, manufacturing, or other industrial use located within the Project area is unknown. A list including the permitted and conditional uses for Industrial areas are listed below.

²The maximum building height requirements for the City of Mankato lists ‘no restrictions’ for the three land use districts which will most likely apply to the Project area. These districts include: B-3 Highway Business District, PI Planned Industrial District, and M-2 Industrial District.

Land Use Scenario B.

Number of residential units: unattached: 0 attached: 0 maximum units per building: 0
Commercial, industrial or institutional building area (gross floor space): total square feet: ~4,341,190

Indicate areas of specific uses (in square feet):

Office: <u>n/a</u>	Manufacturing: <u>n/a</u>
Retail: <u>n/a</u>	Other industrial: <u>~3,700,858 sq ft¹</u>
Warehouse: <u>n/a</u>	Institutional: <u>none</u>
Light industrial: <u>n/a</u>	Agricultural: <u>none</u>
Other commercial (specify): <u>The type of commercial use is currently unknown (conditional uses for highway commercial districts are listed below, which can be found in the City’s Zoning Ordinance (10.40a.Part V. Commercial Districts). However, approximately 640,332 sq ft is the estimated amount of land coverage by structures (see Table 6.2 for more information on land coverage by structures for each sub-district in the AUAR boundary area).</u>	

Building height: no restrictions² If over 2 stories, compare to heights of nearby buildings:

¹The types of Industrial use, whether it is warehouse, light industrial, manufacturing, or other industrial use located within the Project area is unknown. A list including the permitted and conditional uses for Industrial areas are listed below.

²The Maximum building height requirements for the City of Mankato lists ‘no restrictions’ for the three land use districts which will most likely apply to the Project area. These districts include: B-3 Highway Business District, PI Planned Industrial District, and M-2 Industrial District.

According to Mankato’s Zoning Ordinance, Chapter 10, Land Use (Zoning), the City has the following districts which will most likely apply to the Project Area:

- B-3 Highway Business District

- PI Planned Industrial District
- M-1 Industrial District

The current City of Mankato Zoning Map is included to show surrounding zoning classifications (See Exhibit F—Current Zoning Map).

B-3 Highway Business District

The purpose of this district is designed and intended to provide for automobile oriented commercial developments within the vicinity of streets with functional classifications of either arterials or major collectors. Such commercial developments are generally characterized by large parking areas. The district also encourages a broad range of business and light industrial activities.

The following list is comprised of the permitted uses within this district: Antique shops, Apparel stores, Appliance stores and home electronics stores, Art galleries, including commercial display and sales, Art schools and studios, Art supply stores, Auction rooms, Automobile parts stores, not including accessory repair or servicing of motor vehicles or trailers, Bakeries, Banks and savings and loans, Barber and beauty shops, Book stores, Bicycle stores, Blue printing and Photostatting, Business machine stores, Cameral and photographic supplies, Candy, ice cream, and confectionery stores, Caterers, Churches and other religious institutions, Dental, medical, and scientific clinics and laboratories, Department, discount, and variety stores, Dressmakers, seamstresses, and tailors, Drive-in facilities, accessory to a principal use, Drug stores, Dry-cleaning, Laundromats, and diaper services, Essential services utility structures and facilities, Floral sales, Funeral homes, Furniture stores, Garden supply stores and landscape nurseries, Gift and souvenir stores, Grocery stores, Gunsmiths, Hardware stores, Health clubs, Health equipment and sporting goods stores, Hobby stores, Interior decorators, Jewelry stores, Laundry, self-service, Liquor stores (off-sale), Locksmiths, Medical appliance sales and fittings, Music stores, Optical goods, Paint and wallpaper stores, Parks and playgrounds, Photo studios and picture processing and equipment sales, Professional service offices, Repair, rental and service shops, Schools, public and private elementary, middle, secondary, and post-secondary, Shoe stores, Stationery and greeting card stores, Ticket agencies and travel bureaus, Toy stores, Veterinarians, Video Rentals and sales.

Also including: Automobile service stations and car washes, Automobile glass, muffler, and upholstery repair services, Automobile parts and accessory sales, Automobile repair garages, including automobile glass, muffler, tire, and electronics installation, Automobile sales (new and used) and automobile storage, Banks and savings and loans, including drive-in facilities, Boat sales and service, Bowling alleys and billiard parlors, Bus depots, including ticket offices, Catalog and mail order services, Clubs and lodges, Convenience stores, Dairy product stores, Funeral homes, Hotels and motels, Meeting halls, Motorcycle sales, Newsstands, Pet stores, Radio and television broadcasting, including transmitters and studios, Restaurants and other eating and drinking establishments, Secondhand stores, Surface parking lots and parking structures or garages, Theaters, excluding drive-ins, Tire sales and supply stores, Upholstery shops

The following are listed as conditional uses:

Collection of recyclable materials at temporary locations, Community convention centers, Drive-in facilities, accessory to a principal use, Government institutions, Light manufacturing and assembly, Shopping malls, Self-service storage facility, Shipping and outside storage when accessory to a permitted or conditional use, Sport arenas and stadiums, Indoor firing ranges.

PI Planned Industrial District

The purpose of this district is intended to provide strategic sites for certain light industrial development under exemplary standards that assist in making such developments compatible with property in neighboring residential and commercial districts.

The following list is comprised of the permitted uses within this district:

Automobile service stations, Bottling establishments, Cabinet and woodworking establishments, Catalog and mail order houses, Cold storage, Commercial printing, publishing, engraving, and

reproduction firms, Computer hardware and software manufacturing or testing, Design and Manufacturing of: Laboratory instruments and associated equipment, Patterns, and Signs and advertising display materials, Dry-cleaning establishments, Essential service utility structures and facilities, Fabrication and Assembly of: Blank books and loose leaf binders, Radios and televisions, and Temperature controls, Hardware warehousing and distribution operations, Laundries, Lumbeyards, Manufacturing of: Art equipment and supplies, Camera and photographic equipment, Clothing, Dental instruments and supplies, Electric lighting and wiring equipment, Electric measuring and testing equipment, Electronic tubes and other components, Jewelry, Medical and surgical instruments and supplies, and Office furniture and supplies, Manufacturing and Assembly of: Electrical products and appliances, Hand and edge tools, Luggage, handbags, and other similar items, Optical instruments and lenses, Plumbing fixtures and equipment, Precision fixtures and equipment, Scientific and research instruments and equipment, Sports equipment, and Telephone and telegraph technical apparatus, Manufacturing and Fabrication of: Books and bookbinding, Footwear, and Plastic extrusion, molding, and fixtures, Manufacturing and Packaging of: Bakery products and Confectionery and related products, Manufacturing and Storage of: Bags, boxes, and paper containers and Ice and ice cream, Newspaper plants and offices, Pottery shops, Trade schools, Welding supply, Wholesale business facilities, and Indoor firing ranges.

The following are listed as conditional uses:

Daycare facilities, when accessory to a permitted or conditional use, Dwelling units provided for employees, including their families, having duties in connection with any premises requiring them to reside on the premises, Heliports and freight terminals, Recycling centers, Self-service storage facilities, Unenclosed storage of materials, products, and equipment, Other manufacturing, processing, storage, wholesale, commercial, office, construction or service uses.

M-1 Industrial District

The purpose of this district is intended to provide sites for light manufacturing and light industrial uses under controls that minimize any adverse effects on property in neighboring residential, business, or commercial districts.

The permitted uses listed in the PI district (listed above) and the following listed uses: Automobile, airplane, and farm implement assembly, Building materials yards and contractors' yards, Cleaning and dyeing plants, Concrete mixing and concrete products manufacturing, Essential service utility structures and facilities, Light manufacturing industries consisting of the processing, treatment, and packaging of goods and foodstuffs, except alcohol or alcoholic beverages, Outside storage of material and equipment, Railroad lines and spurs, passenger and freight deposits, Recyclable material collection (temporary or permanent), Storage elevators, Wholesale gasoline and oil storage, Indoor firing ranges,

The following are listed as conditional uses: Uses listed as conditional uses in the PI district (listed above), Electricity generating facilities, when not determined to be objectionable due to noise, odor, or vibration, Other wholesale, light manufacturing, construction or service uses similar in character to those listed above.

8. Permits and approvals required.

List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Permits and approvals required. A listing of major approvals and public financial assistance and infrastructure likely to be required by the anticipated types of development projects should be given. This list will help orient reviewers to framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.

All required permits and approvals will be obtained. Any necessary permits or approvals that are not listed in the table below were not intentionally omitted.

Table 8-1. Permits Required

Unit of Government	Type of Application	Status
FEDERAL		
Army Corps of Engineers	Section 404 CWA	Future submittal
STATE		
Minnesota Department of Health (MDH)	Watermain Plan Review	Future submittal
Minnesota Pollution Control Agency (MPCA)	Stormwater Construction Activity NPDES Permit	Future submittal
	Sanitary Sewer	Future submittal
	Indirect Source Permit	Possible submittal
	Sanitary Sewer Extensions and/or Changes Permit	Future submittal
	Wastewater permit	Future submittal
	401 Water Quality Certificate ¹	Future Submittal
MnDOT	Road Access Permit	Future submittal
MnDOT	Utility Permit	Future submittal
DEED	JOBZ Tax Program	Designated Acres in Area
DEED	Greater MN Business Infrastructure Grant	Submitted
State Historic Preservation Office (SHPO)	Cultural Resources Review	Completed
Minnesota Department of Natural Resources (MN DNR)	Natural Heritage Program Threatened and Endangered Species Review	Completed
	Stormsewer Discharge Permit	Future submittal
	Water Appropriations Permit	Future submittal
	Public Waters Work Permit	Future submittal
LOCAL		
Blue Earth County	Utility Permit	Future submittal
	Access Permit	Future submittal
Mankato Twp	Road Access Permit	Future submittal
	Orderly Annexation agreement	Future submittal
City of Mankato	Rezoning	Future submittal
	Sanitary Sewer	Future submittal
	Subdivision Permits	Future submittal
	Grading Permit	Future submittal
	Building Permits	Future submittal
	Wetland Conservation Act	Future submittal
	AUAR	Pending
	Economic Development Funds	Pending
	Comprehensive Plan Amendment	Future submittal

¹The MPCA is limited to waiving many Section 401 certification applications with exceptions. Applications for 401 certifications must still be sent to the MPCA as they have been in the past. In most cases, MPCA's decision will be to issue a waiver but the MPCA reserves the right and authority to proceed differently if extreme or unique circumstances merit a different approach. The waiver of 401 certifications means that the MPCA has not reviewed the proposed federal permit application for conformance with the state water quality standards and requirements as contained in Minn. R. 7050 and all other applicable state rules regarding water quality. In the event of water quality violations caused by the applicant's project, enforcement action may be taken by the MPCA.

9. Land use.

Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

Current & Recent Past Land Use

Please note: The summary of existing and past land uses and potential land use conflicts is included in greater depth in the response to Items 6 and 10.

This area was converted to agricultural land use from historical presettlement vegetation information showing the majority of the project area as Big Woods with portions as wet prairie. The majority of the current land use on the Project site is agricultural with sections of woodland and wetland. There are also residential homesteads located within the Project boundary.

There are no indications that this site has ever had industrial activity on the site. There are no known potential conflicts involving environmental matters or environmental hazards due to past site uses.

Adjacent Land Use Compatibility

Surrounding land use is slowly shifting away from rural uses to urban development. Land uses adjacent to the Project site include agricultural use to the north and east, US Highway 14 to the south with agricultural use beyond, and light industrial to the west, (see Exhibit D—Existing Land Use Plan). The Mankato Land Use Plan (Updated April 2005) identifies future industrial and commercial use surrounding the Project on the north and south, with agricultural preservation area to the east adjacent to the Project site. The Project is compatible with existing and proposed adjacent land uses. There is no known potential land use conflicts associated with existing land uses within the general Project area.

Potential Environmental Hazards

The identification of any existing areas of soil contamination is included under item 19.

Projected Land Use

The Future Land Use maps show subsections G, C and D as Industrial Land Use with a 'Potential Sensitive Resource Area' overlay zone. It is assumed that approximately one-third of the total acreage of the three areas combined will be set aside for wetland preservation, road improvements, regional stormwater facilities, and/or wetland mitigation area, which equals approximately 54 acres. Two of these areas (subsections C and G) may include areas that are undevelopable such as wetland areas or could include possible mitigation area. All of the subsections could include public infrastructure such as roads or regional stormwater facilities, or industrial development. The City did not use the AUAR process to evaluate the potential for development of each parcel of property, but rather to identify the environmental impacts associated with the 'worst-case scenario' for certain land use developments. Even if portions of a subsection cannot be developed because of potential wetland areas, this does not mean the entire subsection is unavailable for development. For example, subsection G is categorized as 'industrial land use' but this does not mean the entire area will be developed. All areas will need to meet wetland guidelines, along with all other City ordinances. As outlined in the approximate land use values used in the traffic, air and noise study, subsection G was known to have large wetland complexes with undevelopable areas. Obviously, all 80 acres within the parcel will not allow development—this projection was used to estimate a 'worst-case scenario' development plan also utilizing a floor-area-ratio to project actual build-out. As part of the traffic, air and noise analysis projections, build-out of subsection G was forecasted at only 50% for the 2025 analysis.

The City also requires a formal wetland investigation be conducted, submitted, and approved prior to starting the preliminary platting process occurs throughout all portions of the City. One thing to note, when the land use plan identifies a certain type of development in an area, this does not warrant permission from the City allowing development throughout the entire area. Exhibit E outlines a land use plan, not a rule or ordinance for development scenarios. Within these development scenarios, the City

reserves the right to set aside areas as natural areas, wetland preservation areas, potential wetland mitigation area, and public open space. Each subsection may also include development in the future, which is also reflected in the exhibits.

The City is also aware that in order for the AUAR to remain valid as a substitute form of review, the environmental analysis document and the plan for mitigation must be revised if five years have passed since the City adopted the original environmental analysis document and plan for mitigation. Since the projected timeline for the extension of CSAH 12 is greater than 5 years and is only in the conceptual stage of planning, the City is aware this AUAR document will most likely need to be updated.

10. Cover types.

Estimate the acreage of the site with each of the following cover types before and after development:

Cover types. The following information should be provided instead:

- a. cover type map, at least at the scale of a USGS topographic map, depicting:
 - wetlands – identified by type (Circular 39)
 - watercourses – rivers, streams, creeks, ditches
 - lakes – identify protected waters status and shoreland management classification
 - woodlands – breakdown by classes where possible
 - grassland – identify native and old field
 - cropland
 - current development
- b. an “overlay” map showing anticipated development in relation to the cover types; this map should also depict any “protection areas,” existing or proposed, that will preserve sensitive cover types. Separate maps for each major development scenario should generally be provided.

Table 10-1. Existing Cover Types

Cover Type	Before Development
Agricultural	504
Residential & Impervious Surfaces	11
Mesic & Dry Introduced Short Grasses & Legumes	34
State Trail & Railroad	13
Mesic Shrub/Scrubland	11
Emergent Wetland w/ Scattered Shrub/Scrub	35
Mixed Mesic Woodland	43
Emergent Scrub Shrub Wetland	19
Saturated & Mesic Grassland & Wetland	30
Excavated Wetland	15
Other—including roads & ROW	35
TOTAL	~750 acres

The largest land cover change will be from a decrease of agriculture use to an increase in impervious surfaces. The new impervious surfaces will include roads, sidewalks, buildings, driveways and parking area. A Natural Resources Assessment was completed by I&S Engineers & Architects, Inc. to determine cover types in the Project Area. A description of each cover type included in the Assessment is provided in Appendix F—Natural Resources Assessment Inventory and a map has also been included showing the existing cover types (Exhibit G—Cover Type Map). A brief description is provided in the following section:

The Project area consists of various land cover types including: impervious/hard surfaces, planted or maintained vegetation, agricultural field, grassland, shrubland, woodland and wetland. The anticipated development sub-sections in relation to the existing cover types can be seen in Exhibit G—Cover Type Map.

Impervious/Hard Surfaces

A portion of the site consists of impervious/hard surfaces. These surfaces include: existing structures, roads, driveways, recreational trails, and railroad tracks.

Agricultural Field

Most of the Project site is in agricultural production. A historical aerial investigation was completed and indicates areas of past agricultural production, which is now grassland and scrubland area. The historical aerial photographs also show many farmed wetlands in the agricultural areas.

Tree Rows

A number of tree row plantings were observed within the Project area. All of the farmsteads within the area are surrounded by tree rows. The farmstead windbreak tree row plantings generally consist of Colorado blue spruce and white spruce with occasional scotch pines, balsam firs, and eastern red cedars. The windbreak under stories contain prickly gooseberry, European buckthorn, American hazelnut, wild grape, black raspberry, stinging nettle, Kentucky bluegrass, common dandelion, and white clover. The farmsteads also have Siberian elm, American elm, green ash, Norway maple, silver maple, and apple trees planted throughout the lawn areas.

A tree row exists adjacent to the Sakatah Trail and it is unknown whether these trees were planted by the Minnesota Department of Natural Resources or if the trees exist by natural revegetation. The tree and shrub species observed along the Sakatah Trail included green ash, Siberian elm, eastern cottonwood, wild plum, crab apple, boxelder, prickly ash, swamp white oak, hackberry, sumac sp., lilac and nannyberry. The herbaceous layer under the tree row along the trail is primarily dominated by smooth brome. Some areas of the tree row include Kentucky bluegrass, Canada bluegrass, red clover, black current, cow parsnip, Queen Anne's lace, prickly gooseberry, Indian grass, reed canary grass, golden Alexander, wild grape, equisetum sp., Solomon's seal, wild strawberry, common violet, bird's foot trefoil and a species of rose.

A tree row planting also exists adjacent to the large excavated wetlands along the southern Project boundary adjacent to TH-22. The shrubs present in the planted rows are tatarian honeysuckle.

Mesic and Dry Introduced Short Grasses and Legumes

Areas of maintained vegetation exist in portions of the Project area mainly in the location of the existing buildings, public road right-of-ways, and on a small portion of Sub-district E. The dry areas throughout this location are dominated by Canada bluegrass, Kentucky bluegrass, common dandelion, yellow foxtail, and squirrel tail. The moist soils are dominated by redtop, yellow foxtail, Canada goldenrod, and path rush. Also present in this area is purslane speedwell, reed canary grass, Canada thistle, and sow thistle.

A second introduced grass and legume area exists in the middle of section G. The area is primarily dominated by red clover in the moist soils, and alfalfa on the hills and drier soils. Giant foxtail, Canada thistle, Canada goldenrod, reed canary grass and wild strawberry are present throughout the short grass seeding. Wild plum and reed canary grass are prominent along the northeast edge of the short grass area.

Mesic Mixed Deciduous Woodland

Section G contains two woodland areas, which will be referred to as the east and west woodland areas. The east woodland is mesic mixed deciduous woodland with scrub-shrub and wetland areas within the woodland boundaries. The area is dominated by green ash with eastern cottonwood, American elm, silver maple, and basswood present. The forested wetlands within this area are dominated by American elm, green ash, and boxelder. There is also a forested/scrub-shrub wetland, which is dominated by green ash, black willow, red-osier dogwood, reed canary grass, and dark green bulrush. The east woodland under story species consist of Virginia waterleaf, stinging nettle, Virginia creeper, common woodland violet, black current, prickly gooseberry, bedstraw, reed

canary grass, Solomon's seal, black raspberry, blood root, burr cucumber, woodland anemone and downy yellow violet.

The west woodland in section G is mesic mixed deciduous woodland with scattered eastern red cedars, and is dominated by boxelder and European buckthorn. Other tree species consist of hackberry, silver maple, and basswood. The herbaceous layer is comprised of smooth brome, reed canary grass, burdock, and young European buckthorn.

Section I contains one large, mesic mixed deciduous woodland, which has scattered forested wetlands throughout. The forested wetlands are dominated by green ash, silver maple, black willow, eastern cottonwood, and reed canary grass. The upland areas consist of tree species including American basswood, rock elm, green ash, and eastern red cedar. The shrub species included European buckthorn, red-osier dogwood, nannyberry, and prickly ash. The under story herbaceous layer consisted of black current, Virginia creeper, Virginia waterleaf, trillium sp., Jack in the pulpit, common violet, bedstraw, and downy yellow violet. This area is dominated by green ash and European buckthorn, and the under story shows poor signs of hardwood sapling regeneration. There were some large American basswoods present along the southern edge of the woodland.

Section H has a small mesic mixed deciduous woodland with a forested/scrub-shrub wetland present within the woodland. Tree species include silver maple, green ash, boxelder, American basswood, and hackberry. The shrub layer is primarily European buckthorn, tatarian honeysuckle, red-osier dogwood, and prickly ash. The herbaceous layer is comprised of Virginia waterleaf, reed canary grass, black current, and Virginia creeper. The wetland area was dominated by reed canary grass, red-osier dogwood, and boxelder.

Mesic Scrub-Shrubland

There are two mesic scrub-shrubland areas within section G adjacent to the east woodland. These areas are dominated by reed canary grass, red-osier and grey dogwood, green ash, and eastern cottonwood. Prickly gooseberry, common dandelion, Kentucky bluegrass, sandbar willow, eastern red cedar, American elm, Siberian elm, wild strawberry, Virginia waterleaf, and various sedge species are also present within this plant community. Small scrub-shrub wetlands exist within the mesic scrub-shrubland area. The wetland areas are dominated by reed canary grass, red-osier dogwood, eastern cottonwood, and green ash saplings. There is also a mature stand of American basswoods to the southeast.

A small area is also present between the excavated wetlands in section I. The area is dominated by reed canary grass, European buckthorn, goldenrod, and green ash saplings. Kentucky bluegrass, big bluestem, common dandelion, and prickly gooseberry are also present in this area.

Emergent and Scrub-Shrub Wetland

Section C has an emergent/scrub-shrub wetland, which is dominated by reed canary grass, red-osier dogwood, and black willow.

Section G has an emergent wetland with scattered trees and shrubs on the north end. This area is dominated by reed canary grass with scattered black willow and red-osier dogwood. Also present in this area is broad-leaf cattail and a *Scirpus* sp. This area of section G also has mesic tall grassland, which is dominated by reed canary grass and some small patches of boxelder. A drainage ditch runs from north to southeast through this area.

There is an emergent/scrub-shrub wetland with mesic grassland located in the southern part of section G. This area is dominated by reed canary grass. Red-osier dogwood,

green ash, black willow, European buckthorn, and stinging nettle are located within this area. In ponded water areas yellow water buttercup are present. A drainage ditch is also present within this area.

Section I has a large emergent wetland with scattered shrubs present along the northeast edge of the section. The wetland area is dominated by narrow-leaved cattail, reed canary grass, and giant reed grass. Other herbaceous species include stinging nettle, black current, giant goldenrod, and a species of equisetum. Shrub species include red-osier dogwood, sandbar willow, and eastern cottonwood. A small portion of this wetland is a sedge meadow, and is dominated by *Carex stricta*.

Section I contains a scrub-shrub wetland with scattered emergent wetland areas and scattered mesic scrub-shrubland. The wetland areas are dominated by reed canary grass, green ash, red-osier dogwood, sandbar willow, and broad and narrow-leaf cattails. Also present in this area are blue flag iris, dark green bulrush, bedstraw, giant goldenrod, prairie cord grass, Canada bluegrass, and various sedge species. There are also areas of planted eastern cottonwood.

Native and Introduced Grassland with Scattered Shrubs

Section I has an area along the east edge that has been seeded to a mixture of native and introduced grasses, forbs, and shrubs planted by the Minnesota Department of Transportation. The grassland species present include big bluestem, switchgrass, Canada goldenrod, greyheaded coneflower, purple coneflower, smooth brome, Canada bluegrass, blue flag iris, wild bergamot, Kentucky bluegrass, Canada wild rye, sweet clover, and golden Alexander. The shrub and tree species present include sandbar willow, red-osier dogwood, amur maple, *Viburnum* sp., and red oak.

Saturated and Mesic Grassland

Section H contains an area that is saturated and mesic grassland, dominated primarily by reed canary grass. This area also contains potential emergent wetlands. The wetter areas have narrow-leaf cattail, dark green bulrush, and path rush. Drier areas are occupied by Kentucky bluegrass, common dandelion, and stinging nettle. Scattered eastern cottonwood, boxelder, black willow and red-osier dogwood are also present throughout the grassland area.

Section G has a saturated and mesic grassland area with potential wetlands scattered throughout. The grassland in the northeast portion of section G has reed canary grass, redtop, Canada wild rye, common dandelion, and pennycress. There is dark green bulrush present in some of the wetter areas. An old ditch bed is present within this portion of the grassland area. This grassland area extends along the west edge of section G to the southern edge. The southern large portion of the grassland area contains reed canary grass, Kentucky bluegrass, perennial rye grass, common dandelion, Canada thistle, pennycress, common ragweed, wild strawberry, giant ragweed, goldenrod, smooth brome, and various sedge species.

Excavated Wetlands

Two excavated wetland areas exist along the southern edge of section I. These excavated wetlands are part of MnDOT's wetland mitigation area and were created as part of TH-22 reconstruction. Both wetlands have significant open water, and are surrounded by broadleaf cattails, sandbar willow, giant reed grass, and hardstem bulrush. The wetland areas are surrounded by upland buffer areas that have been seeded with mixed grasses and planted with shrubs and trees. The upland areas included Indian grass, big bluestem, little bluestem, smooth brome, Kentucky bluegrass, switchgrass, common dandelion, black raspberry, nannyberry, silver maple, and eastern cottonwood. Planted rows of tatarian honeysuckle are also present, and European buckthorn has become established along the upland fringe.

State Trail and Railroad Track Area

The Sakatah Trail area and DM&E railroad track right-of-ways have been seeded with a mix of native and introduced grass and forb species. Trees and shrubs present in these areas appear to have been planted. The herbaceous species present include Kentucky and Canada bluegrass, smooth brome, reed canary grass, Indian grass, common dandelion, common violet, golden Alexander, blue-eyed grass, wild strawberry, birdsfoot trefoil, Solomon's seal, bedstraw, goldenrod, cow parsnip, red clover, multiflora rose, wild grape, prickly gooseberry, and stinging nettle. The tree and shrub species include boxelder, wild plum, Siberian elm, green ash, eastern cottonwood, sumac, nannyberry, wild plum, crab apple, eastern red cedar, swamp white oak, and prickly ash.

There are potential wetland areas within the railroad right of way, and a possible wetland in section D extending from the trail north into the agriculture field.

Planted and Maintained Lawn Seedings

Five farmstead areas existed within the Project area. All of the farmsteads have lawn areas, which are dominated by Kentucky bluegrass, white clover, and common dandelion. Ornamental trees, shrubs and forbs were also observed in some of these areas. Several of these farmsteads have tree row plantings that were discussed earlier in the cover type section of this report.

11. Fish, wildlife and ecologically sensitive resources

- a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

Habitat loss is the most significant impact urbanization has on plants and animals. Conversion of agricultural fields and natural vegetation to urban development is expected to result in a decline in the type and number of wildlife species that currently inhabit this site. Loss of suitable habitat can result from physical landscape modification with impervious surfaces, urban grasses and shrubs. There is also potential for wildlife displacement due to habitat loss. A common misconception is that wildlife will relocate to other areas. Habitat is usually saturated (ie at carrying capacity) for most wildlife species if populations are in balance. In fact, it is more likely that wildlife impacts will be greater than presumed as displaced animals will put stress on neighboring established animals as the displaced individuals disburse. The disbursing animals are more likely to suffer increased mortality or not become part of the breeding population than they are to find a vacant territory and reproduce. Another way that urbanization can affect wildlife is by fragmenting the natural habitat areas. This reduces the travel corridors necessary to some wildlife for escape routes and to reach food, water, and shelter. It is worth noting that in studying the area through site visits and aerial photographs, it appears the MnDOT preservation area and the adjacent vegetated areas could potentially be part of a natural corridor stretching from the south to the northeast to Eagle Lake and beyond. This area has large wetland complexes including woodland and grassland areas that are prime habitat for many wildlife species.

A wildlife survey was conducted at the site May 18-27, 2005. The response to this section is based on this survey. During this inventory no threatened or endangered wildlife species were identified. Information has also been included in this section to include wildlife known to inhabit the area but wasn't necessarily observed during the site visit.

Fish

Agricultural drainage ditches are present within the Project area which could potentially support fish species. However, due to poor water quality from agricultural runoff, and poor aquatic habitat, the number of fish species will be limited to the more tolerant minnow species. Some of these potential minnow species are the common creek chub, common shiner, fathead minnow, and white sucker.

Wildlife

The following section focuses on the various wildlife species that could potentially be supported by the various plant community types found within the Project area. The habitat types include; woodland, short grassland, tall grassland, scrub-shrubland, wetland, agricultural land, and maintained lawn.

Woodland: The woodlands within the area appear to be in fair to poor condition. The dominant tree species are mixed deciduous hardwoods with an abundant shrub layer. Wildlife species that may be present in a community such as this include white-tailed deer, wild turkey, garter snake, great horned owl, deer mouse, red squirrel, grey squirrel, pine squirrel, cottontail rabbit, raccoon, grey fox, American robin, blue jay, and northern cardinal. Based on the lack of large mast producing tree species a number of these wildlife species would receive limited benefit from the woodlands within the area. The presence of an abundant shrub layer allows for a profuse forage base for bird species such as the blue jay and the northern cardinal. The American robin is traditionally a forest or woodland nesting species. White-tailed deer, wild turkey, and the various squirrel species could also use woodlands within the area as cover.

Short Grassland: The short grassland areas are introduced grass and legumes. The dominant plant species throughout these areas is red clover, alfalfa, Kentucky bluegrass, and Canada bluegrass. Wildlife species that may be present in this plant community include ringneck pheasants, American robin, common grackle, European starling, garter snake, white-tailed deer, wild turkey, red tailed hawk, and various small mammal species (ex. white-footed mouse). These short grassland areas will attract various bird species because of the insects attracted to the legumes present in the grassland. The high protein levels provided by the insects are especially important to young pheasants and turkeys. The presence of small mammals in these areas could be minimal because of the lack of high quality seed-producing grasses, which in turn would also decrease the likelihood of any raptor species using the short grassland areas.

Tall Grassland: The tall grassland areas vary from reed canary grass and smooth brome dominated grasslands to mixed native and introduced prairie grasslands. The wildlife species that could occupy these areas will also vary depending on the dominant vegetative cover. Potential wildlife species found within the tall grassland could include ring-neck pheasant, wild turkey, white-tail deer, small rodents (ex. white-footed mouse), coyote, red fox, garter snake, jack rabbit, bobolink, short-tailed weasel, short-tailed shrew, mourning doves, American kestrel, and red-tailed hawk. The various bird species listed above will rely on the tall grasslands for seed production, insect presence, and cover/nesting potential. The small rodent species will be more abundant in areas with large seed production, which in turn will produce more highly attractive grassland areas for the predatory mammal and bird species. White-tailed deer may use the tall grassland as seasonal cover and foraging areas.

Scrub-Shrubland: The scrub-shrublands present are primarily dominated by reed canary grass, red-osier dogwood, wild plum, and tree saplings (green ash, willows, and eastern cottonwood). These areas contain a diverse plant community, which increases the number of potential wildlife species that may also inhabit the area. Common wildlife species include white-tailed deer, coyote, ring-neck pheasants, cottontail rabbit, blue jay, wild turkey, American robin, northern cardinal, small mammals (ex. deer mouse and white footed mouse), garter snake, red-tailed hawk, American kestrel, and American crow. Some of the previously mentioned wildlife species will use the scrub-shrubland as travel corridors from cover habitat to sources of food. Due to the large dominance of reed canary grass, the scrub-shrubland areas may be less valuable to a number of wildlife species within the Project area. The presence of fruit producing shrubs will increase the likelihood for the presence of northern cardinals, blue jays, pheasants, wild turkey, and deer. Small mammal numbers will increase in areas with good seed and fruit

producing plants, which could potentially lead to an increase in the number of predatory species as well.

Wetland: The wetland areas include forested, emergent, scrub-shrub, and excavated wetlands. Wetlands serve as a source of water for almost every wildlife species, and the species list that follows represent species that use wetland specifically for cover and/or for forage purposes. Forested wetlands are commonly used by wood ducks, mallards, woodcock and raccoon. Emergent wetlands could potentially contain red-winged blackbird, yellow-headed blackbird, mallard, Canada geese, blue wing teal, green wing teal, pintail, northern shoveler, great blue heron, American egret, mourning doves, common snipe, woodcock, rail, raccoon, mink, muskrat, and barn swallows. Scrub-shrub wetlands are commonly used by wood ducks, mallards, red-winged blackbird, yellow-headed blackbird, mallard, Canada geese, blue wing teal, green wing teal, pintail, mourning doves, common snipe, woodcock, raccoon, mink, and muskrat. The excavated wetlands within the project area could potentially attracted mallard, Canada geese, blue wing teal, green wing teal, pintail, northern shoveler, great blue heron, American egret, mourning doves, raccoon, mink, muskrat, double-crested cormorant and barn swallows. Wetland generalist frog species such as the spring peeper and the northern leopard frog could potentially benefit from any of the various wetland types within the area. Various snail species could potentially be present in the wetland areas.

Agricultural Land: Agricultural land can serve as a temporary cover and food source for white-tailed deer, ring-neck pheasants, Canada geese, various species of ducks, wild turkey, raccoon, coyote, and jack rabbits.

Maintained Lawn: The farmsteads within the project area can serve as habitat and a food source for common grackle, American robin, blue jay, European starling, and various other songbird species.

State Trail/Railroad Right-of-way: These areas could provide travel corridors for various wildlife species. American robin, blue jay, mourning doves, killdeer, and other perching bird species will use these areas for foraging and nesting.

Table 11-1. Species Observed During Wildlife Survey (May 2005)

Cover Type Area	Species
Woodland/Forest	Wood Duck (pair), White-tailed deer (tracks), Blue Jay
Grassland	White-tailed deer, Mourning dove, American robin
Wetland	Canada Goose, Blue-winged teal (pair), Mallard, unidentified frog, Red-winged blackbird, Yellow-headed blackbird, Mourning dove
Shrub/Scrubland	Common garter snake, Cottontail rabbit, Ring-necked pheasant, deer mouse
State Trail/Railroad	American robin, Killdeer
Maintained Lawn	Common grackle, American robin, Mourning dove, White-tailed deer (tracks)

The wooded areas may also be utilized by a variety of species including red fox, coyote, bats, woodchuck, ground squirrel, striped skunk, eastern chipmunk, and the gray, red and fox squirrel. Birds commonly found in the areas near the site include sparrows, finches, orioles, cardinals, warblers, owls, blue birds, wrens, chickadees, swallows, larks, crows and woodpeckers.

Ecologically Sensitive Resources

The Minnesota Department of Natural Resources does not list any special concern, threatened, or endangered species on or adjacent to the Project area (see question 11b).

All of the cover types identified during the inventory, with the exception of the agricultural land and maintained lawn, will be sensitive to development of the area. However, from an ecological perspective, the cover types throughout the Project area are not rare habitats.

A small portion of the large emergent wetland identified in section I is a sedge meadow, and is worthy of noting as a plant community type of ecological importance. However, this does not claim that the area should be treated as a special concern habitat type, and if the development is unable to avoid impacts to this area it should be considered for replacement.

This Project will likely displace some of the wildlife population that uses the vegetated areas for cover, food and protection. The current landuse consisting mainly of agricultural use provides habitat and corridor connections to surrounding vegetated areas. The development of industrial landuse will possibly fragment these corridors, decreasing connections to natural areas, and in turn, potentially put stress on wildlife that inhabit the area. The following strategies are proposed to help mitigate potential impacts to wildlife habitat.

MITIGATION

- Existing natural habitat areas (including woodland, wetland, open water) will largely remain untouched with conservation easements placed on the properties to protect these areas into the future, specifically in subsections C, D, and G.
- The Project is not expected to result in regionally significant decline in wildlife abundance or species diversity. Measures to reduce the effects on wildlife include park and open space preservation and construction of stormwater ponding. These measures are expected to provide additional habitat for wildlife and nominally mitigate adverse effects on some wildlife.

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site? ☐ Yes ☒ No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: ERDB #20050731.

Describe measures to minimize or avoid adverse impacts.

A review was conducted by the Department of Natural Resource's Natural Heritage and Nongame Research Program (NHNRP) (Appendix B—MN DNR Correspondence). A search of the Minnesota Natural Heritage database determines if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius. Based on this review, there are no known occurrences of rare species or natural communities within approximately one-mile of the Project site. The NHNRP database is continually updated and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. However, this database is not comprehensive and there may be significant natural features in this area that are not represented in this database. A county-by-county survey of rare natural features is currently underway, and has been completed for Blue Earth County, therefore information about natural communities is quite thorough for this county. However, because survey work for rare plants and animals is less exhaustive, and because there has not been an on-site survey of all areas of the county, ecologically significant features for which the DNR has no record may exist in the area.

12. Physical impacts on water resources.

Will the project involve the physical or hydrologic alteration — dredging, filling, stream diversion, outfall structure, diking, and impoundment — of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☒ Yes ☐ No

If yes, identify water resource affected and give the DNR Protected Waters Inventory number(s) if the water resources affected are on the PWI: N/A. Describe alternatives considered and proposed mitigation measures to minimize impacts.

Physical impacts on water resources. *The information called for on the EAW form should be supplied for any of the infrastructure associated with the AUAR development scenarios, and for any development expected to physically impact any water resources. Where it is uncertain whether water resources will be impacted depending on the exact design of future development, the AUAR should cover the possible impacts through a “worst case scenario” or else prevent impacts through the provisions of the mitigation plan.*

Possible hydrologic alterations include impoundment of surface water runoff associated with the creation of drainage ponds to maintain pre-development runoff flow rates and it is anticipated there will be some wetland filling and replacement in association of specific development projects. All development in the Project area will be subject to City ordinance once annexation into the City of Mankato is complete. A detailed wetland investigation will be completed according to the criteria set forth in the Army Corps of Engineers 1987 Manual for all areas before development occurs at the Project site. Wetlands found on the site through the investigation will be handled in accordance to the 1991 Minnesota Wetland Conservation Act (WCA) and the Clean Water Act Section 404 administered by the Army Corps of Engineers. Mankato also has a wetland setback ordinance in place which requires a 16.5-foot setback from a delineated wetland. There will be no dredging, filling, stream diversions, diking of any surface waters such as a lake, pond, stream, or drainage ditch associated with this Project, however, there may be some outfall structures to an unnamed drainage ditch located north of the Project Boundary (See Exhibit N—Stormwater Management Plan). If an outfall structure is designed to be constructed below the ordinary high water elevation, a DNR Protected Waters permit approval will be required. Hydraulic and hydrologic modeling will be completed to help determine and maintain pre-development runoff rates and Best Management Practices will be used to minimize impacts.

Blue Earth County Soil Survey maps, National Wetland Inventory (NWI) maps, Protected Water Inventory (PWI) maps, and historical aerial photographs were reviewed to determine possible wetland areas. Areas currently in agricultural production may have previously been wetland area, except, due to drain tile installation and drainage ditch excavation, some of these wetlands may no longer meet the hydrology and/or Hydric soil criteria as described by the Army Corps of Engineers 1987 Manual.

However, wetland areas identified within this report are not based on an official wetland delineation. The wetland types and general locations described in the following section are based on the sources listed above. Prior to construction and/or excavation, an official wetland investigation will be completed to determine the presence, type, and boundary of all wetland areas on the site in accordance with the criteria set forth in the Army Corps of Engineers 1987 Manual.

The following section gives greater detail regarding possible wetland areas within the Project boundary. The site is divided by the subsections shown in Exhibit E—Future Land Use Plan. A map showing Hydric soils and the NWI map is also included as Exhibit I—Hydric Soils & NWI Map. Wetland areas on the Project site are defined below:

Subsection A thru F.

These sections are currently used for agricultural purposes with a few residential homesteads. The NWI map does not indicate the presence of any wetland basins on these sections. The soil survey indicates very poorly drained soils do exist on portions of this area. Depressional areas or basins do exist within these sections. However, a majority of these basins have been impacted by the installation of drainage tile. Degraded wetland basins are present in the southwest corner of section F. These wetland areas are considered Type 1 palustrine emergent temporarily flooded, partially drained/ditched (PEMAd). A degraded wetland area also exists in the southeast corner of section C. This wetland is a Type 3 palustrine emergent/scrub-shrub broadleaved deciduous, seasonally flooded, partially drained/ditched (PEM/SS1Cd).

Subsection G.

This section of the Project has five wetland basins indicated on the NWI map. Two wetlands exit on the north end of the property. The wetlands include a Type 3 palustrine emergent seasonally flooded, partially drained/ditched (PEMCd) wetland surrounded by a Type 3 palustrine scrub-shrub broadleaved deciduous, seasonally flooded (PSS1C) wetland. The third wetland indicated on the NWI is located near the southeast boundary of this section. The wetland is a Type 1 palustrine scrub-shrub temporarily flooded, partially drained/ditched (PSS1Ad) wetland. The final two wetlands on the NWI are located in and along the east edge of the woodland. The wetlands are listed as a Type 1 palustrine forested broadleaved deciduous, temporarily flooded, partially drained/ditched (PFO1Ad) wetland.

Subsection H.

The majority of this section is in agricultural production and has been ditched to improve the crop potential. The NWI indicates one Type 1 palustrine forested broad-leaved deciduous, temporarily flooded, partially drained/ditched (PFO1Ad) wetland in the southern part of this section. During the site visit, potential wetlands were also identified in southern and southeastern portions of this section. Potential wetland areas were identified as Type 1 palustrine emergent, temporarily flooded, partially drained/ditched (PEMAd) wetlands.

Subsection I.

This section is identified as the Minnesota Department of Transportation (MnDOT) Preservation Area. This section includes eight wetlands indicated on the NWI. The wetlands listed on the northeast half of the section include three Type 3 palustrine emergent, seasonally flooded, partially drained/ditched (PEMCd) wetlands, and two Type 3 & 4 palustrine emergent, semi-permanently flooded, partially drained/ditched (PEMFd) wetlands. The southwest half of this section includes a Type 3 palustrine emergent, seasonally flooded (PEMC) wetland and two Type 1 palustrine forested broadleaved deciduous, temporarily flooded, partially drained/ditched (PFO1Ad) wetlands.

Two wetlands not indicated on the NWI also exist on the southern edge of this section. During the site visit, these wetlands were identified as Type 5 palustrine unconsolidated bottom mud, intermittently exposed excavated (PUBGx) wetlands.

When Hwy 14 was reconstructed, MnDOT put aside acres of wetland preservation area, and mitigated for wetland impacts from construction. MnDOT actually shifted the alignment of Hwy 14 south to avoid impacting the high quality wetlands in this area. The preservation area and mitigation area from the reconstruction project are within the current Project boundary and are outlined as subsection I. This area consists of 50 acres of wetland preservation area which MnDOT has banked for wetland credits, and 20 acres of wetland mitigation area.

MITIGATION

A detailed wetland investigation will be completed according to the criteria set forth in the Army Corps of Engineers 1987 Manual for all areas before development occurs at the Project site. The results of the investigation will be submitted to the City of Mankato for review. Wetlands found on the site through the investigation will be handled in accordance to the 1991 Minnesota Wetland Conservation Act (WCA) and the Clean Water Act Section 404 administered by the Army Corps of Engineers. Best Management Practice (BMP) requirements mandate wetlands be protected from erosion and sedimentation throughout all phases of the Project. Site runoff will be routed through treatment ponds and infiltration areas prior to any offsite, and potential wetland integration. Mankato Zoning Ordinance Section 10.82, Subd 11. Environmentally sensitive areas wetlands, outline wetland setbacks as: All structures and other impervious surfaces shall maintain a 16.5 foot setback from the boundary of a wetland. The setback area shall be maintained with naturally occurring vegetation.

Any wetland impacts involved with the development of the Project will be administered in accordance with the Minnesota Wetland Conservation Act and Section 404 of the Clean Water Act, which is regulated by the Army Corps of Engineers. All attempts will be made to try and avoid wetland impacts by sequencing during the design and layout of phases of the Project. All sequencing requirements must be satisfied prior to the City's approval of any wetland impacts or wetland replacement plans. Proper sequencing implies that all attempts to avoid wetland impacts, both direct and indirect, have been considered. If avoidance of impacts can not be accomplished, then the wetland impacts must be minimized by limiting activities within the wetland to the maximum feasible extent. All unavoidable wetland impacts must then be replaced by wetland restoration, wetland creation, or the purchasing of credits from a wetland bank account. Wetland replacement for impacts within the City of Mankato has a minimum ratio of 2:1 (New Wetland Credit + Public Value Credit: Impacted Wetland Area). Section 404 of the Clean Water Act authorizes the Army Corps of Engineers to issue permits for wetlands under their jurisdiction. The Army Corps of Engineers will require the same sequencing standards as listed above. However, wetland impacts will require a wetland replacement of 1.5:1 (Replacement wetland area – New Wetland Credit: Impacted wetland area).

13. Water use.

Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☒ Yes ☐ No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

Water Use. *If the area requires new water supply wells specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed.*

Water Wells

The Project will require the abandonment of water wells. The Minnesota Department of Health (MDH) and the Minnesota Geological Survey's (MGS) County Well Index (CWI) indicates there is one registered well within the Project boundary. The well listed (unique no. 00652854) is located on the Kruse homestead located off of CSAH 3 (Thompson Ravine Road) in the central portion of the site. There may also be other private wells located within the Project boundary which are not registered in the CWI, such as wells at the three other homesteads located within the project boundary. All existing wells located on the site or identified (including any unregistered wells encountered during construction), will be sealed and abandoned in compliance with MDH regulations prior to site development.

According to the Minnesota Department of Health, (See Appendix D—MN DOH Correspondence) there are no Drinking Water Supply Management Areas in the propose Project area.

The Project will not involve the installation of individual water wells.

Public Water Supply

Development at the site will utilize the City of Mankato's public water supply. The City's water system includes municipal wells, storage tanks/towers, and treatment facilities. Mankato's Department of Natural Resources Water Appropriation Permit number is 70-1412. Preliminary calculations by the City Engineer indicated the City's water supply system has the capacity to meet the needs of the Project.

The City appropriates water from a combination of sources including 5 wells. Four of the wells are deep wells, cased and open rock hole type, seven hundred (700) feet deep.

These include wells # 5, 11, 12, and 14 are constructed into the Mt. Simon Hinckley Aquifer. Two of the wells cannot be pumped to the Water Plant for treatment and are used for emergency standby.

The second source is a Ranney vertical cassion with horizontal collector laterals with three pumps at sixty (60) feet deep. The Ranney well is also considered a groundwater source (though it will influence both the surface and groundwater in the area) and is detailed under DNR Installation #13. The collector well has nine, twelve inch laterals or screens out horizontally in different directions at one elevation two feet off the bottom or fifty-eight (58) feet deep. The water filters through the center and is pumped to the Water Plant. The Ranney Well has the capacity to pump six million gallons of water per day.

Currently, these wells have a combined capacity of approximately 10.0 million gallons of water per day (mgd) with 2.5 mgd of elevated storage capacity and an average daily usage of 5.1 million gallons. Individual information for these wells can be found in the following table:

Table 13-1. Public Water Supply Wells

Well No.	Unique No.	Diameter	Depth	Capacity
5	209826	24 inch	715 ft	800 gpm
11	209395	24	848	650
12	209391	30	852	950
14	458567	18	630	650
13	209830	16	57	4750 ¹

¹Ranney vertical cassion with horizontal collector laterals with three pumps: Pump #1: 1900 gpm, Pump #2: 1450 gpm, Pump #3: 1400 gpm

Source: MN DNR Water Appropriations Permit Program information, 2004

According to the MN DNR Water Use—Water Appropriation Permit Program, the City is authorized to appropriate 2,000 million gallons per year (MGY) under this permit. In 2003, the City of Mankato reported pumping 1,865.257 MGY of water and in 2004 the City pumped 1,732.395 MGY, according to Sean Hunt, Water Management, MN Department of Natural Resources—Waters. Utilizing last years demand level, the City has 267.605 MGY additional capacities under the current DNR water appropriation permit.

The approximate anticipated water use for full build-out of the Project area by year 2025, depending on the scenario, is between 211.244 and 223.726 MGY. This is based on one-fourth of the estimated peak daily sanitary sewer demand calculated for the Sanitary Sewer Master Plan for Mankato Minnesota by Zenk Read Trygstad & Associated, Inc. Additionally, the peak daily demand will increase an estimated 2.85 million gallons as a result of fully constructing this project.

The Project will require an estimated increased water supply of 61.622 MGY and 0.785 MGD peak demand by year 2009. The City currently has enough permitted appropriation volume to accommodate a full build-out of the Project. However, based on the future anticipated growth of the Mankato area, it is likely the City will need to amend their DNR permit to provide for anticipated growth of the Mankato area in addition to the Project, prior to the year 2025, or before the Project area is fully developed.

The City of Mankato is in the process of improving their water supply system with the addition of two new wells. The City of Mankato has proposed to drill two wells into the Ranney vertical cassion with horizontal collector laterals instead of a well into the Mt. Simon-Hinckley Aquifer.

Watermains will connect with existing water supply systems and will loop through the development and connect to existing points to service the property. The exact location and size of watermains and the route of watermain looping is unknown at this time, but will be

addressed in future planning stages of the Project. Watermain connections to the existing system will occur at CSAH 3 to the west, through Eastwood Industrial Park at Technology Drive, and possibly through Augusta Meadows subdivision at Fieldcrest Drive and Augusta Drive to the north. Exhibit O—Water Supply System Plan shows the existing watermain locations and sizes, and the location of where the watermain could be extended to service the site. Both the northern and western water supply stubs include an 8- and 12-inch connection.

The city's existing watermains will not need to be enlarged to increase water pressures and flows between the city and the proposed development. The quantity of water used is expected to be proportional to the amount of sanitary wastewater used. The number of wells and the estimated pumping ratios for the public water supply system is usually based on the maximum daily water demand. The maximum daily demand is usually four times the average daily water usage. Groundwater levels are not anticipated to be affected nor are any impacts on other water resources. Table 13-1 provides information on the estimated water demand for each proposed land use scenarios:

Table 13-2. Estimated Water Demands

SUB-DISTRICT AREA	SCENARIO A. ESTIMATED UNITS			SCENARIO B. ESTIMATED UNITS		
	Proposed Land Use	Acres	Estimated million gallons per year	Proposed Land Use	Acres	Estimated million gallons per year
A.	Industrial	53	20.803 ¹	Commercial	98	8.321 ²
B.	Industrial	112	43.960	Industrial	67	43.960
C.	Industrial	28	10.990	Industrial	28	10.990
D.	Open Space	54	—	Open Space	54	—
E.	Industrial	80	31.400	Industrial	80	31.400
F.	Industrial	157	61.623	Industrial	157	61.623
G.	Industrial	80	31.400	Industrial	80	31.400
H.	Industrial	60	23.550	Industrial	60	23.550
I.	Open Space	70	—	Open Space	70	—
TOTAL			223.726 mgd			211.244 mgd

¹The estimated quantity of water need for each sub-section with landuse proposed is based on 25% of the peak hourly flow rate of 5,000 gallons per acre per day or 1,250 gallons per acre per day. This peak hourly demand number is obtained from peak flow rates for presently unsewered and/or undeveloped areas as defined in Section II Design Criteria, Sanitary Sewer Master Plan for Mankato, Minnesota.

²The estimated quantity of water need for each sub-section with commercial landuse proposed is based on 25% of the peak hourly flow rate of 2,000 gallons per acre per day or 500 gallons per acre per day. This peak hourly demand number is obtained from peak flow rates for presently unsewered and/or undeveloped areas as defined in Section II Design Criteria, Sanitary Sewer Master Plan for Mankato, Minnesota.

Dewatering

There will not be any anticipated appropriation of any ground or surface water (including dewatering) in the development of the Project. However, one or more temporary dewatering systems may be necessary to conduct construction activities including the installation of roads, sanitary sewer, municipal water, and stormwater facilities in some areas. Contractors will carry out these activities on a case-by-case basis at the minimum duration and quantity necessary to construct utility services for the affected sites. The quantity and duration of construction dewatering is not known at this time, but it is expected that any dewatering at the site will be temporary. If dewatering is found to be necessary, and if dewatering exceeds 10,000 gallons per day or 1 million gallons in a year, then a DNR Water Appropriation Permit application will be submitted.

If it becomes apparent that dewatering on the site from construction purposes will not exceed 50 million gallons in total and for the duration of one year from the start of pumping, the contractor or project proposer will apply to the DNR for coverage under DNR General permit 97-0005 for Temporary Water Appropriation. If appropriation is needed, any groundwater from construction dewatering purposes will be discharged to temporarily or

permanent stormwater ponds located within the Project boundary. Dewatering activities, if required, are not expected to affect existing wetland areas.

Construction activities requiring dewatering are not anticipated to be extensive enough and/or continue for an extended period of time in order to impact domestic or municipal wells.

14. Water-related land use management district.

Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☐ Yes ☒ No
If yes, identify the district and discuss project compatibility with district land use restrictions.

Water-related Land Use Management Districts. Such districts should be delineated on appropriate maps and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR area are envisioned, this should be discussed.

No state or federally-designated wild or scenic river districts occur within or adjacent to the Project site, nor does the site involve a shoreland zoning district. According to the Federal Emergency Management Administration (FEMA) map (FIRM panel #275231 0045 D dated 3/5/90, and panel # 275231 0050 E dated 7/21/99), the site is within 'Zone X' which is described as, "areas determined to be outside a 500-year floodplain," therefore, the Project does not involve a delineated 100-year flood plain.

15. Water surface use.

Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

Water surface use. This item need only be addressed if the AUAR area would include or adjoin recreational water bodies.

The Project site is not adjacent to nor does it contain bodies of water to support watercraft usage.

16. Erosion and sedimentation.

Give the acreage to be graded or excavated and the cubic yards of soil to be moved:
acres n/a; cubic yards n/a. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

Erosion and sedimentation. The number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included.

Steep Slopes

The general site topography of the Project area is generally flat in developable areas with average slopes ranging from 1-4% (See Exhibit B—USGS Topography Map). There are no steep slopes present within or adjacent to the Project area.

Highly Erodible Soils

According to the United States Department of Agriculture (USDA), which includes the Farm Service Agency (FSA) and the Natural Resources Conservation Services (NRCS), there are no portions of the Project site classified as Highly Erodible Land (HEL). The USDA aerial photograph of section 2, 3, 10 and 11 shows all of the tilled areas in the Project

boundary as NHEL, meaning, Not Highly Erodible Land.

Erosion & Sedimentation

The City of Mankato has extensive requirements for erosion and sediment control for new developments. Wetlands are also required to be protected from erosion and sedimentation throughout all phases of the Project. Site runoff for this Project will be routed through treatment ponds and infiltration areas prior to any offsite, and potential wetland, integration. The proposer is required to maintain pre-development runoff flow rates for this Project using the Minnesota Pollution Control Agency (MPCA) Best Management Practices (BMPs) to minimize impacts.

The Developer must obtain and comply with National Pollutant Discharge Elimination System (NPDES) permit requirements, including a Stormwater Pollution Prevention Plan (SWPPP). A SWPPP will be developed to meet the NPDES requirements and City regulations and will include:

- Management of stormwater discharge during construction
- Use of Best Management Practices (BMPs) to control erosion
- Inspection of all erosion controls at least once every seven days during active construction and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours

Effective erosion and sediment control using MPCA Best Management Practices (BMPs) is required for all land disturbances to control water runoff and sediment erosion on adjacent properties, streets, storm drains, pond areas, or other water courses (see [MPCA website](#) for additional information). The erosion and sediment control measures will be used during and after construction and must be inspected and repaired regularly. BMPs for construction activity on the site will include items such as silt fence, straw bales, filter fabric, seeding, and rip rap. A sample of the requirements is also summarized below.

- Property and streets adjacent to the site of a land disturbance shall be protected from sediment deposition. This shall be accomplished by preserving a well-vegetated buffer strip around the lower perimeter of the land disturbance, by installing perimeter controls such as sediment barriers, filters, dikes or sediment basins, by stockpiling soil in appropriate locations or by a combination of such measures.
- All storm sewer inlets which are functioning during construction shall be protected so that sediment-laden water will not enter the conveyance system without first being filtered or otherwise treated to remove sediment.
- Property and waterways downstream from development sites shall be protected from flooding and erosion due to increases in the volume, velocity and peak water flow rate of stormwater runoff. Concentrated stormwater runoff leaving a development's site shall be discharged directly into a well-defined natural or man-made off-site receiving channel or pipe.
- A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized forthwith after land disturbing activity is complete.
- Whenever construction vehicles access public roads, provision shall be made to minimize the transport of sediment by runoff or vehicle tracking onto the paved surface. Where sediment is transported onto a public road surface, the roads shall be cleaned thoroughly at the end of each day.
- All temporary and permanent erosion and sediment control practices shall be maintained and repaired to assure the continued performance of their intended function.
- All temporary erosion and sediment control measures shall be removed within thirty

(30) days after final site stabilization is achieved or after the temporary measures are no longer needed.

The construction shall provide specific performance standards to prevent or reduce, to the most practical extent, erosion and sedimentation and their associated effects within the City and to provide protection of adjacent properties and the preservation of soil and water resources. It is anticipated that potential adverse erosion and sedimentation impacts will be limited primarily to short-term effects, and not expected to affect water quality in adjacent wetlands and watercourses over the long term.

17. Water quality: surface water runoff

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

Water Quality-stormwater runoff. For an AUAR the following additional guidance should be followed in addition to that in "EAW Guidelines":

- it is expected that an AUAR will have a detailed analysis of stormwater issues;
- a map of the proposed stormwater management system and of the water bodies that will receive stormwater should be provided;
- the description of the stormwater systems would identify on-site and "regional" detention ponding and also indicate whether the various ponds will be new water bodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.
- if present in or adjoining the AUAR area, the following types of water bodies must be given special analyses:
 - lakes: within the Twin Cities metro area a nutrient budget analysis must be prepared for any "priority lake" identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and DNR staffs;
 - trout streams: if stormwater discharges will enter or affect a trout stream an evaluation of the impacts on the chemical composition and temperature regime of the stream and the consequent impacts on the trout population (and other species of concern) must be included;

The Project's proposed stormwater management system is conceptual in nature and is used as a basis for reviewers to identify and evaluate areas of potential impacts. As part of the preliminary plat process and prior to the Project consideration by the City of Mankato, the final engineered design is required to demonstrate project compliance with all applicable Local/State/Federal regulations. In addition to the National Pollution Discharge Elimination System (NPDES) permit and the Storm Water Pollution Prevention Plan (SWPPP), the Mankato City Zoning Ordinance is in place for the protection, preservation, maintenance and use of the water and soil resources in this area.

According to the 1996 National Water Quality Inventory by the MPCA, stormwater runoff is a leading source of water pollution. In general, stormwater runoff can harm surface waters such as rivers, lakes, and streams which in turn, cause or contribute to water quality standards being exceeded. The most common urban stormwater impacts to natural hydrology include:

- 1) The watersheds natural response to precipitation events is altered,
- 2) Runoff velocity is increased,
- 3) Total runoff volume is increased,
- 4) Peak discharge rates are increased, and
- 5) Groundwater infiltration is decreased.

The Minnesota Pollution Control Agency (MPCA) is designated to be in charge of reducing the pollution and damage caused by stormwater runoff. This designation was mandated by Congress under the Clean Water Act. In 1990, the EPA promulgated rules establishing Phase I of the NPDES stormwater program. This program included regulation for MS4s to implement a stormwater management program to control polluted discharges. The Phase II rule extends coverage of this program to smaller municipalities and businesses and includes the City of Mankato. The requirements of the Phase II MS4 program include: 1) Reduce the discharge of pollutants to the "maximum extent practicable", 2) Protect water

quality; and 3) Satisfy the appropriate water quality requirements of the Clean Water Act. Minnesota regulates the disposal of stormwater through a combined NPDES/SDS permit and through the Municipal Separate Storm Sewer Systems (MS4s) program for applicable projects. The City of Mankato has been very proactive in their approach to Stormwater master planning, but will need to update its existing Stormwater Master Plan to include the mandated MS4 standards, including the following 6 minimum control measures:

- 1) Public Outreach/education
- 2) Public involvement/participation
- 3) Illicit discharge detection/elimination
- 4) Construction site runoff control
- 5) Post construction stormwater management
- 6) Good housekeeping for municipal operations

The local stormwater program must establish measurable goals, best management practices to meet these goals, and a way to track performance and progress. These new rules will apply to the Project area and will need to be addressed during the design phase of construction. The BMPs will need to include measures to prevent or reduce the pollution of the waters of the State, including schedules of activities, prohibition of practices, maintenance procedures, and other management tools. For more information of BMPs, see question 16.

Existing Conditions

The majority of the soils in the Project area are in the hydrologic condition classified as Type C/D with a few smaller areas classified as A and B. According to the Blue Earth County Soil Survey (1978), the hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and received precipitation from long-duration storms. The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a permanent high water table, soils that have a clay loam or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Mankato ordinance requires that the post-development runoff rates do not exceed pre-development conditions. Regional and site specific stormwater ponds will be constructed to treat quantity and quality of runoff from the Project site.

Pre-Development Site Runoff

The Project site is located within the Minnesota River-Mankato major watershed. Most of the site is currently being farmed with areas of the site containing woodland and wetland complexes. Current surface water runoff and erosion from the field and from field tiles is directed into a drainage ditch north of the site.

According to the 1997 drainage plan prepared for the City of Mankato by Barr Engineering, with modifications added which include additional storage areas, the site is located in part of the North Industrial System Southeast and Northeast districts. These areas are included in the plan and several stormwater detention areas are recommended as the land in the area becomes developed. The City's long-term drainage plan indicates a regional treatment pond in the northern section of the Project area and also on a section in the center of the southern half of the area. The City's zoning ordinance, Sect. VI: Zoning Districts and District Provisions, requires that no more than 40% of the lot be covered by structures. This requirement may help keep a large portion of the development pervious. This would allow infiltration of water to keep runoff as low as possible. Surface water runoff is predominantly discharged from the site by surface flow to the east and north toward the drainage ditch running perpendicular to CSAH 12, north of the Project area. Hydrologic data regarding the existing site drainage will be modeled through a computer modeling system such as HydroCAD by Applied Microsystems.

Existing runoff from the site likely contains fertilizer, pesticide, and herbicide residue due to the agricultural land use on the majority of the property.

Post-Development Site Runoff

Post-development site runoff will be typical of urban and mixed-use developments. There will most likely be an increase in phosphates and other substances typically associated with urban runoff. The quantity of runoff will most likely increase because of the addition of impervious surface area such as the construction of pavement, buildings and parking lot area. The existing wetlands on the site are a concern with the increase of urban runoff. In general, urban runoff impacts to wetlands include: 1) increases in wetland bounce, 2) decrease in wetland plant and animal species diversity, 3) long-term alterations or destruction of wetland type and function, 4) peak discharge rates are increased, and 5) groundwater infiltration is decreased.

Through the construction of a storm sewer system, and stormwater basins, the majority of the stormwater runoff from the development will be treated. This treatment will remove sediment from the stormwater and enhance the quality of runoff leaving the site. The proposed stormwater system will be designed to accommodate and safely manage off-site flows as well as the flow generated on-site. The stormwater basins will lower peak flows from the site to below pre-development flow rates for 2, 10, and 100-year rainfall events. During and after construction, stormwater will be routed through these basins to prevent off-site sedimentation and wetland impacts. As stated earlier, the City of Mankato will need to update its existing Stormwater plan to include the mandated 6 minimum control measures for MS4s. This revised stormwater plan will need to be followed for Project development.

- b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The Project site is located in part of the North Industrial System Southeast and Northeast districts (See Exhibit K—Watershed Areas Map). These local watersheds are included within: 32082: Le Sueur River which outlets to Eagle Lake, 28041: Middle Minnesota River, which outlets to an unnamed creek that flows to the Minnesota River, and 28042: Middle Minnesota River which outlets to the Minnesota River. The Minnesota River will receive the majority of runoff from the proposed Project along with smaller streams and wetlands.

Stormwater generated will be routed into stormwater ponds that will provide rate control and water quality treatment before discharging to local waterbodies. The stormwater system will be designed to meet all NPDES guidelines and standards for removal of suspended sediment, phosphorus, and other nutrients from stormwater runoff. Stormwater ponds will be designed to reduce the amount of nutrient loadings entering the Minnesota River. The Project is expected to have only minor effects on the quality and water levels of

downstream water resources.

Efforts will meet or exceed the City's ordinance to control erosion and prevent sedimentation. Mitigation measures are vital to avoid compounding to the downstream nuisance. See question 16 for a description of BMP mitigation measures. BMPs implemented during and after construction will be inspected and repaired regularly. As stated earlier, the proposer must obtain and comply with NPDES permit requirements, including the preparation of a SWPPP. The MPCA has set guidelines for the SWPPP. Below is a brief list of some of the items the proposer must provide and comply with in the SWPPP to prevent sedimentation to downstream sources:

- Address the potential for sediment and pollutant discharges from the site
- Identify chain of responsibility for general contractor and owner Identify temporary sediment basins, if more than 10 acres are disturbed and drain to a single point of discharge
- Identify permanent stormwater management system
- Identify erosion prevention practices
- Identify sediment control practices
- Identify dewatering and basin draining practices
- Identify inspection and maintenance practices
- Identify pollution prevention management measures
- Describe the timing of BMP installation
- Location and type of temporary and permanent BMPs
- Include standard plates and specifications of BMPs

The proposer must also follow strict erosion prevention practices which must be installed in an appropriate and functional manner. Some erosion prevention practices may include, but are not limited to:

- Construction phasing
- Vegetative buffer strips
- Temporary seeding
- Sod stabilization
- Horizontal slope grading
- Minimize land disturbance
- Preserve trees and natural vegetation
- Mulch or wood fiber blanket
- Stockpile covers

The proposer must also follow strict erosion control practices as set by the MPCA which must minimize sediment from entering surface waters, curb and gutter systems, and storm sewer inlets. These practices are based on specific site circumstances and may include the following items:

- Protect storm drain inlets
- Control temporary soil stockpiles
- Control vehicle tracking with stone pads, concrete, steel wash racks or equivalent
- BMPs remain until final stabilization
- Silt fences
- Inlet protection
- Check dams
- Sedimentation traps and basins

- Stabilized construction entrances

The proposer is also required to conduct inspections and maintenance. These requirements must:

- Occur every seven days
- Occur within 24 hours of ½" storm
- Occur once a month on finally stabilized area
- Be routinely recorded and kept with the SWPPP
- Ensure the integrity and effectiveness of erosion prevention and sediment control measures
- Repair or replace nonfunctional BMPs
- Drain and remove sediment from basins
- Inspect surface waters, drainage ditches and conveyance systems for sediment
- Remove sediment deposits and stabilize any exposed soil during sediment removal
- Inspect and clean vehicle exits
- Ensure infiltration areas are protected

18. Water quality: wastewaters

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

Water Quality-Wastewater. *Observe the following points of guidance in an AUAR:*

-only domestic wastewater should be considered in an AUAR—industrial wastewater would be coming from industrial uses that are excluded from review through an AUAR process;

-wastewater flows should be estimated by land use subareas of the AUAR area; the basis of flow estimates should be explained; -the major sewer system features should be shown on a map and the expected flows should be identified;

-if not explained under item 6, the expected staging of the sewer system construction should be described;

-the relationship of the sewer system extension to the RGU's comprehensive sewer plan and (for metro area AUARs) to Metropolitan Council regional systems plans, including MUSA expansions, should be discussed. For non-metro area AUARs, the AUAR must discuss the capacity of the RGU's wastewater treatment system compared to the flows from the AUAR area; any necessary improvements should be described;

-if on-site systems will serve part of the AUAR the guidance in "EAW Guidelines" (pages 16-17) should be followed.

The EQB guidance indicates that only domestic wastewater should be considered for this question. Sanitary waste will be produced by commercial and industrial structures within the Project. No on-site municipal or industrial wastewater treatment is planned for the Project. All sanitary wastewater from the Project will be treated at the Mankato Wastewater Treatment Plant. The calculated waste produced for the Project can be seen in the table below:

Table 18-1. Proposed Sanitary Waste (Peak Flows)

SUB-SECTION	SCENARIO A.					SCENARIO B.				
	Land Use	Rate	Acres	Total GPD	Total MGY	Land Use	Rate	Acres	Total GPD	Total MGY
A.	Commercial	5,000 gal/ac/day ¹	53	265,000	96.73	Commercial	2,000 gal/ac/day ²	53	106,000	38.69
B.	Industrial	5,000 gal/ac/day	112	560,000	204.4	Industrial	5,000 gal/ac/day	67	560,000	204.4
C.	Industrial		28	140,000	51.1	Industrial		28	140,000	51.1
D.	Industrial	—	54	—	—	Industrial	—	54	—	—
E.	Industrial	5,000 gal/ac/day	80	400,000	146.0	Industrial	5,000 gal/ac/day	80	400,000	146.0
F.	Industrial		157	785,000	286.53	Industrial		157	785,000	286.53
G.	Industrial		80	400,000	146.0	Industrial		80	400,000	146.0
H.	Industrial		60	300,000	109.5	Industrial		60	300,000	109.5
I.	Open Space	—	70	—	—	Open Space	—	70	—	—
TOTAL FOR PROJECT				2,850,000 GPD	1,040.3 MGY				2,691,000 GPD	982.2 MGY

¹The estimated quantity of wastewater generated for each sub-section with industrial landuse proposed is based on a peak hourly flow rate of 5,000 gallons per acre per day. This number is used to determine peak flow rates for presently unsewered and/or undeveloped areas as defined in Section II Design Criteria, Sanitary Sewer Master Plan for Mankato, Minnesota.

²The estimated quantity of wastewater generated for each sub-section with commercial landuse proposed is based on a peak hourly flow rate of 2,000 gallons per acre per day. This number is used to determine peak flow rates for presently unsewered and/or undeveloped areas as defined in Section II Design Criteria, Sanitary Sewer Master Plan for Mankato, Minnesota.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

No on-site sewage systems are proposed in connection with the proposed Project.

Composition of the sanitary waste after treatment will meet required standards prior to discharge. The Mankato Wastewater Treatment Plant utilizes physical, biological, and chemical systems to treat the wastewater. Wastewater is screened prior to pumping and sent to the removal facility. Primary clarifiers allow settling and remove phosphorus. The flow from the primary clarifiers is distributed to aeration basins for biological treatment. From these basins the flow travels to secondary clarifiers for separation. The treated water from the secondary clarifiers is disinfected and goes through the final effluent tank and is discharged into the Minnesota River.

Solids removed from the system are thickened to concentrate the solids and then transferred to digesters where it is heated with methane gas. After the required detention time the sludge is transferred to a secondary digester for storage unit which is pumped and filtered for dewatering. The biosolids produced here are stored in a bunker and land applied as fertilizer on nearby farmland in the fall.

Mankato's water is tested daily and meets and exceeds State and Federal water quality standards. The Wastewater Treatment Plan recently received an upgrade that greatly enhanced the quality of water entering the Minnesota River and is designed for use through the year 2020.

The MPCA issued a permit to the city allowing a partnership between the City and Calpine Corporation, an energy production company. Calpine will be constructing and operating a new water reclamation facility adjacent to the City's existing WWTP. The effluent from the WWTP will enter Calpine's facility for additional treatment before being routed to Calpine's Mankato Energy Center, a power plant currently under construction. Calpine will use the reclaimed water for processing and cooling. Calpine's facility will be designed to provide two additional stages of treatment to wastewater. The first stage involves supplemental

phosphorus removal that reduces phosphorus concentrations, and the second stage includes additional filtration and chlorination to ensure a water standard typically reserved for crop irrigation. This facility will increase the capacity of the City's wastewater treatment facilities while creating a beneficial re-use of treated effluent while reducing the amount of phosphorus entering the Minnesota River.

- c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

Sanitary waste from the Project service area will be treated at the Mankato Wastewater Treatment Plant (See question 18b for treatment information). Using the recommended standards for wastewater facilities (see question 18a), the calculated waste produced by the Project will be have an estimated peak demand of 2.85 MGD for Land Use Scenario A, and 2.691 MGD for Land Use Scenario B.

The Mankato Wastewater Treatment Plant has an average design flow of 11.25 MGD. The WWTP's permitted capacity will increase to 18 MGD once the Calpine power plant is finished (See 18b for more information). Average demand for the system is 6.9 MGD for 2004. This Project will increase the number of gallons per day flowing through the Plant. Utilizing the average flow to the WWTP and a peak flow to characterize a worst case scenario for the Project, the WWTP could increase to 9.75 MGD. The Plant recently received an upgrade and is designed for use through the year 2020. No improvements are necessary to increase capacity to service this project.

The site will be serviced through a series of lateral and trunk sanitary sewer lines. The location of sanitary sewer in the area of the Project has been properly planned for future development with trunk sewer routes and lift stations available for development. Sanitary sewer for the Project will be served mainly through an extension from Hwy 22 across toward the Project along CSAH 3 using a 15" gravity main (See Exhibit M—Sanitary Sewer System Plan). The trunk lines have been sized to anticipated future development and have adequate depth to serve the Project by utilizing a gravity sewer system. It is also possible that development in the northwest of the Project area could connect with sewer lines stemming from Augusta Meadows, with extensions from Augusta Drive (15") and Fieldcrest Drive (8"). The layout to service this area will be determined during the conceptual layout phase and will be finalized during the preliminary platting process for development in the area.

- d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

The proposed Project does not generate or require disposal of liquid animal manure.

19. Geologic hazards and soil conditions

- a. Approximate depth (in feet) to ground water: 0-1.0' minimum 3.0' average
to bedrock: 200' minimum 205' average

Geologic hazards and soil conditions. A map should be included to show any groundwater hazards identified. A standard soils map for the area should be included.

The depth to groundwater is provided in the Blue Earth County Soil Survey. In the areas with a lower elevation, the depth to the water table is 1.0' or less while areas up gradient may have up to 5.0' to the water table.

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

There are no known sinkholes, shallow limestone formations, or karst conditions observed on or adjacent to the site according to the DNR's Karst Features Database. If such features are encountered on the site, actions will be taken to mitigate potential effects such as soil stabilization, stormwater routing, and groundwater protection practices.

b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

The following table lists the soils found onsite with the family or higher taxonomic class also listed. Soils information is from the Blue Earth County Soil Survey. See Exhibit H—Soil Type Map for additional information.

Table 19-1. Mapped Soils

Soil Symbol	Soil Name	Family or Higher Taxonomic Class
86	Canisteo silty clay loam, 0-2% slope	Typic Haplaquolls, fine-loamy, mixed, mesic
109	Cordova clay loam, 0-2% slope	Typic Argiaquolls, fine-loamy, mixed, mesic
114	Glencoe silty clay loam, 0-2% slope	Cumulic Haplaquolls, fine-loamy, mixed, mesic
230	Guckeen silty clay loam, 1-4% slope	Aquic Hapludolls, fine, montmorillonitic, mesic
239	Le Sueur clay loam, 1-3% slope	Aquic Argiudolls, fine-loamy, mixed, mesic
230	Lura silty clay	Cumulic Haplaquolls, fine, montmorillonitic, mesic
110	Marna silty clay loam, 0-2% slope	Typic Haplaquolls, fine, montmorillonitic, mesic
997	Marna-Barbert complex, 0-2% slope	Typic Haplaquolls & Argialbolls, fine, montmorillonitic, mesic
525	Muskego muck, 0-2% slope	Limnic Medisaprists, coprogenous, euic, mesic
539	Palms muck, 0-2% slope	Terric Medisaprists, loamy, mixed, euic, mesic
286	Shorewood silty clay loam, 1-6% slope	Aquic Argiudolls, fine, montmorillonitic, mesic

Potential for Groundwater Contamination

According to the Soil Survey for Blue Earth County, the potential for groundwater contamination is estimated to be low susceptibility based on the soil types for the area.

20. Solid wastes, hazardous wastes, storage tanks

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

Solid wastes; hazardous wastes; storage tanks. For a, generally only the estimated total quantity of municipal solid waste generated and information about any recycling or source separation programs of the RGU need to be included. No response is necessary for b. For c, potential locations of storage tanks associated with commercial uses in the AUAR should be identified (e.g., gasoline tanks at service stations).

The City of Mankato contracts with Waste Management to provide curbside refuse and recycling services within the city limits. Refuse is processed and burned – only 15% of Mankato's refuse collected is landfilled. Refuse and recycling is picked up once a week.

Waste and debris from construction activities will temporarily generate waste on the site. The amount of construction waste will be typical of a construction project. Contractors will dispose of any wastes generated at the site in an approved facility and according to City of Mankato's Ordinance.

After construction, solid waste will be generated within the Project associated with commercial and industrial development. All solid waste will be handled by a City of Mankato licensed solid waste hauler. All solid wastes will be managed in accordance with ordinances of the City of Mankato

According to the MPCA, commercial entities that produce any amount of hazardous waste are regulated as hazardous-waste "generators" with requirements that depend upon the amount of waste they produce. These requirements are part of the federal Resource Conservation and Recovery Act (RCRA) and Minnesota Hazardous Waste Rules, designed to protect people and the environment from the effects of improper management of hazardous wastes from commercial sources. All hazardous wastes generated at the site will be handled in accordance to MPCA guidelines and Minnesota Hazardous Waste Rules.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

The EQB guidance indicates that no response is necessary in an AUAR for this question.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

There is no indication that any tanks currently exist on the Project site.

Gas stations are proposed to be permitted uses within both land use scenarios. The potential location of a gas station is likely near major roadways. If this is the case, below ground storage tanks for petroleum storage would be present. These tanks would be required to be registered with the MPCA and must comply with state law and regulations regarding such facilities.

21. Traffic.

Parking spaces added see below. Existing spaces (if project involves expansion) N/A. Estimated total average daily traffic generated see below. Estimated maximum peak hour traffic generated (if known) and time of occurrence: see below. Provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

***Traffic.** For most AUAR reviews a relatively detailed traffic analysis will be needed, especially if there is to be much commercial development in the AUAR area or if there are major congested roadways in the vicinity. The results of the traffic analysis must be used in the response to item 22 and to the noise aspect of item 24.*

Instead of responding to the information called for in item 21, the following information should be provided:

—a description and map of the existing and proposed roadway system, including state, regional, and local roads to be affected by the development of the AUAR area. This information should include existing and proposed roadway capacities and existing and projected background (i.e., without the AUAR development) traffic volumes;

—trip generation data —trip generation rates and trip totals—for each major development scenario broken down by land use zones and/or other relevant subdivisions of the area. The projected distributions onto the roadway system must be included;

—analysis of impacts of the traffic generated by the AUAR area on the roadway system, including: comparison of peak period total flows to capacities and analysis of Levels of Service and delay times at critical points (if any);

—a discussion of structural and non-structural improvements and traffic management measures that are proposed to mitigate problems;

Note: in the above analyses the geographical scope must extend outward as far as the traffic to be generated would have a significant effect on the roadway system and traffic measurements and projections should include peak days and peak hours, or other appropriate measures related to identifying congestion problems, as well as ADTs.

The Project is proposing to use County State Aid Highway (CSAH) 3 as the main vehicular access point. CSAH 3 currently outlets to CSAH 86 and Trunk Highway (TH) 22. Internal roads will be constructed to service the Project with the final location of roads within the

development determined during the preliminary platting for this Project. The City of Mankato, with recommendations from MnDOT will choose the location of roads and other access points.

Due to the size of this development in comparison to the surrounding area, traffic levels will be substantially affected. A map of the existing transportation routes in the Project area can be found in Exhibit L—Transportation Plan. Alternative transportation can also be addressed with the use of sidewalks and pedestrian paths.

The mixed-use development of this Project results in a very broad estimation of traffic and parking space projections. Estimating parking spaces and traffic can vary considerable depending on the time of year and also with the types of commercial land use.

SRF Consulting Group, Inc. conducted a traffic study for the City of Mankato to assist the City in planning for future infrastructure in the Project area of the City (see Appendix E—Transportation, Air, and Noise Analysis). This study focused on assessing the traffic related impacts of future developments in this area and identifies the infrastructure necessary to support these developments.

The traffic study analyzed PM peak hour traffic conditions in years 2009 and 2025 under several scenarios listed below. The analysis focused on the PM peak hour because of the commercial activities that dominate land use in the area (this period is the worst case scenario).

- 2009 without development in the Project area
- 2009 with initial development in sub-section F
- 2025 without Project development
- 2025 with Project development Land Use Scenario A
- 2025 with Project development Land Use Scenario B

The land uses for Scenarios A (Exhibit E₁—Land Use Scenario A and Scenario B (Exhibit E₂—Land Use Scenario B) are shown summarized in Table 21-1:

Table 21-1. Year 2025 AUAR Land Use Summary

Future Land Use Type	Scenario A	Scenario B
Commercial	None	53 acres
Industrial	570 acres	517 acres
Open Space	54 acres	54 acres
Mn/DOT Preservation Area	70 acres	70 acres

Existing Conditions

The traffic study did not analyze existing conditions. A previous memorandum done for the Mankato Area Transportation MATAPS Northeast Area Study, that covered the same areas as the current study, analyzed 2002 PM Peak hour traffic conditions. The Synchro/SimTraffic model results indicated that all study intersections operated at Level of Service (LOS) C or better, with 2002 traffic controls and geometrics.

Intersection capacity analysis results identify a level of service (LOS) that indicates the quality of traffic flow through an intersection. Level of service ranges from LOS A through LOS F. Level of service A indicates the best traffic operation with vehicles experiencing minimal delays. Level of service F indicates an intersection where demand exceeds capacity and traffic flows breakdown. Level of service A through D are generally considered acceptable by drivers. Level of service E indicates than an intersection is operating at or very near its capacity and that vehicles experience substantial delays.

2009 Analysis

The purpose of this traffic study was to test the impact of various land use scenarios and develop strategies to mitigate its impacts. To isolate the effects of the AUAR development, the study analyzed traffic conditions that included background development only, i.e., no development in the Project area, but development outside the area. This development consisted of two parts: traffic passing through the Project area road network and traffic generated by development occurring in the study area, but outside the Project area. The study assumed pass-through traffic increased by one percent per year and 35 percent of the development anticipated by 2025 would occur by 2009 (about 4,000 trips in the PM peak hour). Table 2 summarizes the development assumed outside and inside the Project area. The background development assumptions are based on the previous MATAPS Northeast Area Study.

The study used the background development, land use assumptions, and Institute of Transportation Engineers (ITE) trip generation rates to develop trip generation estimates for the PM peak hour for each area of development. The added trips and existing travel patterns (shown in Figure 4, Appendix E) were used in Traffix software to develop turn movements at study intersections. Prior to adding growth to the 2002 base counts (which were used to approximate pass-through trips), some adjustments were made to the 2002 base counts to account for the Victory Drive extension that opened in 2004 and connects Madison Avenue to the CSAH 3 interchange at US 14 (2002 volumes were adjusted downward on TH 22 and on side streets from Madison Avenue to CSAH 3). Final 2009 turn movements were based on 2002 base counts adjusted for the Victory Drive extension and grown one percent per year and trips generated by development inside and outside the Project area. It should be noted that updated turn movement counts were not available to assess the Victory Drive impact.

Table 21-2. Year 2009 Land Use Summary

Future Land Use Type	Outside AUAR Area		Inside AUAR Area	
	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips
Commercial	1,189,000 sq ft	3,179	None	0
Industrial	None	0	1,231,005 sq ft	289
Residential	530 units	483	None	0
Additional PM Peak Hour Trips		3,662		289

The Traffix model was run to obtain turning movement volumes with and without the Project development. Turning movement output from the Traffix model was then input into a Syncho/SimTraffic model for operations analysis. Traffic operations at key intersections were analyzed to determine the impact of the Project development during the PM peak hour. Figure 5 shows the following key intersections were analyzed in the 2009 scenarios:

- TH 22 and CSAH 3
- TH 22 and US 14 North Ramps
- TH 22 and US 14 South Ramps
- TH 22 and Adams Street
- TH 22 and Madison Avenue
- CSAH 12 and CSAH 3
- CR 86 and CSAH 3
- CR 86 and US 14
- CR 86 and Madison Avenue

Assumed Roadway Improvements and Results of 2009 Analysis

The assumed roadway network and geometrics was a second factor in the 2009 analysis. A total of four 2009 scenarios were analyzed, scenarios with and without Project development and with and without roadway improvements. Table 21-3 summarizes the results. The 2009 analyses with roadway improvements include the following at the TH 22 and Adams Street intersection:

- Westbound to northbound right turn bay
- A second eastbound to northbound left turn bay (making this movement a dual left)

Table 21-3. Year 2009 Intersection Level of Service Results

Intersection	No Roadway Improvements		With Roadway Improvements	
	No Project Development	Initial Project Development	No Project Development	Initial Project Development
TH 22 and CSAH 3	C	C	C	C
TH 22 and US 14 North Ramps	B	B	B	B
TH 22 and US 14 South Ramps	B	B	B	B
TH 22 and Adams Street	F	F	D	D
TH 22 and Madison Avenue	C	C	C	C
<i>CSAH 12 and CSAH 3</i>	A	A	A	A
<i>CR 86 and CSAH 3</i>	A	A	A	A
<i>CR 86 and US 14</i>	B	B	B	B
<i>CR 86 and Madison Avenue</i>	B	B	B	B

Italics denote the intersection is unsignalized

The results suggest the proposed Project development has little impact on key intersection operations in 2009. With no improvements, the TH 22 and Adams Street intersection is shown to operate at LOS F. With the stated improvements, its operations are shown to improve to the LOS D.

2025 Analysis

The same process was used to develop 2025 traffic information, with one exception, the 2002 base volumes were adjusted for additional factors (in addition to the Victory Drive extension): the opening of a CSAH 12 extension continuing from its current alignment east of TH 22 south past Madison Avenue including an interchange at US 14, and the conversion of the US 14/CR 86 intersection into a CR 86 overpass (with no access to or from US 14). The following key intersections were analyzed in the 2025 scenarios (shown in Figure 5—Appendix E):

- TH 22 and CSAH 3
- TH 22 and US 14 North Ramps
- TH 22 and US 14 South Ramps
- TH 22 and Adams Street
- TH 22 and Madison Avenue
- CSAH 12 and CSAH 3¹
- CSAH 12 and US 14 North Ramps^{1,2}
- CSAH 12 and US 14 South Ramps^{1,2}
- CSAH 12 and Madison Avenue¹
- CR 86 and CSAH 3
- CR 86 and Madison Avenue

¹CSAH 12 was initially analyzed with one lane in each direction with right and left turn lanes.

²For the purpose of this analysis, the north and south ramps were assumed to be a parclo design (i.e., folded diamond in the northwest and southeast quadrants).

Table 21-4 summarizes the 2025 land use assumptions. The number of trips generated by the land uses assumed in this study range from 75 to 80 percent of those generated by the original MATAPS NE Area Study (i.e. the current study assumes less intense land use than that assumed in the 2002 MATAPS NE Area Study).

Table 21-4. Year 2025 Land Use Summary

Future Land Use Type	Outside AUAR Area		Inside AUAR Area – Scenario A		Inside AUAR Area – Scenario B	
	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips
Commercial	2,631,100 sq ft	6,627	None	0	384,200 sq ft	1,065
Industrial	68,000 sq ft	67	2,161,500 sq ft	1,528	1,841,300 sq ft	1,070
Residential	1,750 units	1,673	None	0	None	0
Office or Medical Office	331,100 sq ft	753	None	0	None	0
Additional PM Peak Hour Trips		9,120		1,528		2,135

Assumed Roadway Improvements and Results of 2025 Analysis

2025 Base Road Network

The 2025 land use assumed outside of the Project area is substantial. Because of the substantial growth assumptions, it was assumed that all 2025 development scenarios include the proposed street network shown in Figure 5—Appendix E (both the solid and dashed lines). Improvements include a CSAH 12 extension, a US 14/CSAH 12 interchange, and a TH 14/CR 86 overpass among others. These improvements are consistent with findings from previous studies. All intersections analyzed on the new CSAH 12 corridor were also assumed to be signalized. These improvements were considered the “Base Network” for the roadway system. Even with the new US 14/CSAH 12 interchange and CSAH 12 extension, Table 21-5 shows that the Base Network roadway system is not capable of supporting even the background development as most analyzed intersections on TH 22 operate at LOS F. When additional development is added in AUAR Scenarios A and B, operations continue to be poor on the TH 22 corridor, and worsen at some intersections on the CSAH 12 corridor.

Table 21-5. Year 2025 Intersection Level of Service Results

Intersection	Base Road Network ¹			Initial Roadway Improvements ²			Final Roadway Improvements ³		
	No Project Development	Project Development		No Project Development	Project Development		No Project Development	Project Development	
		Scenario A	Scenario B		Scenario A	Scenario B		Scenario A	Scenario B
TH 22 and CSAH 3	F	F	F	D	D	E	C	D	D
TH 22 and US 14 North Ramps	F	F	F	C	C	D	C	C	C
TH 22 and US 14 South Ramps	D	D	D	C	C	D	B	B	B
TH 22 and Adams Street	F	F	F	D	D	D	D	D	D
TH 22 and Madison Avenue	F	F	F	D	D	D	D	D	D
CSAH 12 and CSAH 3	B	C	C	B	C	C	B	C	C
CSAH 12 and US 14 North Ramps	B	B	B	B	B	B	B	B	B
CSAH 12 and US 14 South Ramps	B	B	B	B	B	B	B	B	B
CSAH 12 and Madison Avenue	B	B	C	B	B	C	B	B	C
CR 86 and CSAH 3	A	<i>B</i>	<i>B</i>	A	<i>B</i>	<i>B</i>	<i>BA</i>	<i>B</i>	<i>B</i>
CR 86 and Madison Avenue	A	<i>B</i>	<i>B</i>	A	<i>B</i>	<i>B</i>	A	<i>B</i>	<i>B</i>

¹Level of Service using the Base Network analysis

²Level of service using the Base Network plus improvements shown in Figure 6 (i.e., Initial Roadway Improvements).

³Level of Service using the Base Network, Initial Roadway Improvements, plus improvements listed on page 14 (i.e., Final Roadway Improvements).
Italics denote the intersection is unsignalized

2025 Initial Roadway Improvements

The No Project development scenario with roadway improvements included a number of geometric improvements as well as signal phasing changes. Figure 6—Appendix E illustrates the geometric improvements required to address the majority of the operational problems caused by growth outside the Project area. In addition to these improvements, overlapping right turn signal phasing (the right turn receives a green arrow at the same time as a complimentary left turn) was added for the eastbound to southbound right turns at the TH 22 and CSAH 3 intersection, for the westbound to northbound right turns at the TH 22 and Adams Street intersection, for the westbound to northbound right turns at the TH 22 and Madison Avenue intersection, and for the westbound to northbound right turns at TH 22 and Bassett Drive.

With these improvements, all intersections operate at LOS D or better without development in the Project area and with Project development Scenario A. But with the more intense commercial development of Scenario B, the intersection of TH 22 and CSAH 3 falls to a LOS E.

2025 Final Roadway Improvements

To accommodate the additional traffic generated by Project development, additional roadway improvements beyond those initially addressed were analyzed to address growth outside the Project area. The identified improvements were:

- TH 22 and CSAH 3: second left turn bay added on the east and west approaches for the eastbound to northbound left turns and westbound to southbound left turns.
- CSAH 3 and Excel: intersection signalized, left turn bays added on Excel.

Table 5 shows that with the final roadway improvements, all intersections in all scenarios operated at LOS D or better. Comparing operations between the No Project development and Land Use Scenario A, results show changes in operations at the following intersections:

- TH 22 CR 86 and CSAH 3, CR 86 and Madison Avenue – fell from LOS A to LOS B.
- CSAH 12 and CSAH 3 – fell from LOS B to LOS C
- TH 22 and CSAH 3 – fell from LOS C to LOS D.

Doing the same comparison for No AUAR and Land Use Scenario B, operations at the following intersections changed:

- CR 86 and CSAH 3, CR 86 and Madison Avenue – fell from LOS A to LOS B.
- CSAH 12 and CSAH 3, CSAH 12 and Madison Avenue – fell from LOS B to LOS C.
- TH 22 and CSAH 3 – fell from LOS C to LOS D.

Findings and Recommendations

- In 2025, the studied land uses in Scenario A generate 1,528 trips in the PM peak hour, 2,135 trips in Scenario B. The AUAR Scenario A development comprises 14 percent of the total number of PM peak hour trips, 19 percent in Scenario B. Together with the background development, Scenario A generates 75 percent of the trips generated in the previous MATAPS study, and Scenario B generates 80 percent.
- Thirty-five percent of the 2025 development (approximately 4,000 trips in the PM peak hour) is assumed to occur by 2009. The AUAR development assumed for 2009 comprises about 7 percent of the total 2009 assumed development.
- Trip distribution is consistent with previous MATAPS work, including internal traffic rerouting to account for completion of the Victory Drive extension (affecting the 2009 and 2025 analyses) and the CSAH 12 extension (affecting the 2025 analyses).
- For the 2009 analysis, Table 21-6 shows no additional roadway improvements are needed to accommodate the initial AUAR development beyond those needed to address background growth.

Table 21-6. Summary of Roadway Improvements

Improvements	No Project Development ¹	Project Development ²	MATAPS Findings ³
2009			
1. Dual left with right turn lane on Adams Street at TH 22/Adams Street Intersection	✓	✓	2009 Not Analyzed
2025			
A. Six-lane TH 22 (Bassett to Augusta)	✓	✓	✓
B. Dual left turn bays with right turn bays on all approaches at:			
TH 22 and CSAH 3	✓	✓	✓
TH 22 and Adams Street	✓	✓	✓
TH 22 and Madison Avenue			✓
C. CSAH 12 extended with TH 14/CSAH 12 interchange ⁴	✓	✓	Did not recommend interchange
D. Four-lane CSAH 3 from Excel to CSAH 12 with turn lanes	✓	✓	✓
E. Four-lane Madison Avenue (east of TH 22 to CSAH 12) with turn lanes	✓	✓	✓
F. Four-lane Adams Street	✓	✓	✓
G. Right-in/right-out access at Premiere Drive on west side of TH 22 (east side exists today)	✓	✓	✓
H. Signalize CSAH 3 and Excel Drive intersection and add side-street left turn bays		✓	
I. Signalize Madison Avenue and TWP 353 and add side-street left turn bays	✓	✓	
J. Overlapping right turn signal phasing for:	✓	✓	
West approach at TH 22 and CSAH 3	✓	✓	Recommends dual right turn lanes (TH 22/Madison - East approach only)
East approach at TH 22 and Adams Street	✓	✓	
East approach at TH 22 and Madison Avenue	✓	✓	
East approach at TH 22 and Bassett Drive	✓	✓	

¹Check indicates improvement needed to address development outside the Project area

²Shaded cells with check indicates improvement needed to address Project development.

³Check indicates consistency with previous MATAPS NE Area Study

⁴CSAH 12 extended was analyzed as two through lanes (one in each direction) with left and turn bays. However, the Aggressive Growth analysis (see appendix B in Appendix E—Traffic, Air & Noise Analysis), showed a need for four through lanes plus turn lanes. The study recommends planning CSAH 12 as a four-lane facility with turn lanes for the ultimate cross section.

- For the 2025 analysis, Table 21-6 shows some additional improvements are needed to support the additional development within the AUAR area. The improvements focus on the number of left turn bays at the TH 22/CSAH 3 intersection and intersection control and the development of side-street left turn bays at the CSAH 3/Excel Drive intersection.
- The City of Mankato, Blue Earth County, and the Minnesota Department of Transportation should work together to preserve right-of-way in and limit access to the CSAH 3, CSAH 12, Madison Avenue, and TH 22 corridors. These roadways are anticipated to have high traffic demands and serve important roles in the network. Their importance will continue to increase as the Mankato area continues to develop.
- The TH 22 and Adams Street intersection is experiencing and will continue to experience operational problems because of its proximity to the River Hills Mall and its limited space for capacity expansion (the capacity of this intersection is

constrained by existing development). The existing Adams Street capacity cannot adequately serve the long-term traffic demand. The City of Mankato should work toward developing options that address short- and long-term capacity needs. The city is in the process of conducting an Adams Street study to identify specific improvements.

- Results show the CSAH 12 extension will function at an adequate level of service as a two-lane facility (one lane in each direction) with turn lanes for the 2025 land use scenarios analyzed. However, results from the Aggressive Growth analyses (see appendix B in Appendix E—Traffic, Noise & Air Analysis), showed a need for a four-lane CSAH 12 plus turn lanes (two lanes in each direction). The study recommends planning CSAH 12 as a four-lane facility with turn lanes for the ultimate cross-section.

22. Vehicle-related air emissions.

Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

Vehicle-related air emissions. *The guidance provided in "EAW Guidelines: should also be followed for an AUAR. Mitigation proposed to eliminate any potential problems may be presented under item 21 and merely referenced here. The MPCA staff should be consulted regarding possible ISP requirements for certain proposed developments; although the RGU may not want to assume responsibility for applying for an ISP for specific developments, it may be desirable to coordinate the AUAR and ISP analyses closely.*

Information regarding vehicle-related air emissions was provided by SRF Consulting (See Appendix E—Transportation, Air & Noise Analysis. Carbon monoxide (CO) is the traffic-related pollutant that is most likely to be a concern in Minnesota. Concentrations of CO are generally highest at intersections with poor levels of service and, consequently, more idling vehicles. The MPCA has established state standards (or maximum permissible concentrations) for CO of 30 parts per million (ppm) for a 1-hour period (average concentration), and 9 ppm for an 8-hour period (average concentration). The MPCA 1-hour standard is more stringent than the federal standard of 35 ppm.

The effects of the Project on air quality were examined through analysis of CO concentrations after construction near two selected worst-case intersections. The analysis was performed using forecast traffic volumes, proposed intersection geometrics, and optimized signal timing. Two computer models: the U.S. EPA MOBILE6.2 emissions model and the U.S. EPA CAL3QHC dispersion model were used to predict future concentrations at designated locations.

The emission and dispersion modeling included the following assumptions:

Analysis Years	2009 and 2025
<u>Traffic Assumptions:</u>	
Speed Class	Arterial, posted speed limits
Traffic Mix	National Default
Traffic Age Distribution	MPCA data

<u>Meteorological and Topographic Assumptions:</u>	
Wind Speed	1 meter/second
Temperature	-8.8 degrees Celsius
Wind Direction	36 directions at 10 degree increments
Absolute Humidity:	75.0 grains/lb
Stability Class	D
8-Hour Persistence Factor	0.7
Surface Roughness	108 centimeters

<u>Fuel Assumptions:</u>	
Fuel Program:	Conventional Gasoline East
Fuel Reid Vapor Pressure:	9.0 lbs/square inch
Oxygenated Fuels:	Ethanol with 2.7 percent oxygen content

Background Carbon Monoxide Concentrations

Background CO concentrations represent conditions without the influence of nearby vehicles. By definition, the background CO concentration in any particular area is that concentration which exists independently of direct contributions from nearby traffic. The background concentrations are added to intersection-scale modeled results to yield predicted CO levels.

In lieu of current local CO background data, MPCA default background concentrations were used. These concentrations are 3 ppm and 2 ppm for one and eight hour exposure times respectively.

For purposes of the CO analyses, the background concentrations were adjusted for region-wide increases in traffic volumes. As a worst-case assumption, no adjustment for vehicle emissions reductions was used. As recommended by the MPCA, no temperature correction factor was required as the default background concentrations are based on assumed winter conditions. The results are summarized in Table 22-1.

Table 22-1. Calculation of CO Background Concentrations

Factor	2009		2025	
	1-Hour	8-Hour	1-Hour	8-Hour
Default 2005 Concentration (ppm)	3.0	2.0	3.0	2.0
Background Traffic Volume Adjustment Factor	1.13	1.13	1.81	1.81
Worst-Case Background Concentration (ppm)	3.4	2.3	5.4	3.6

Intersection Carbon Monoxide Modeling

Detailed air quality analyses were performed for the years 2009 and 2025 at two worst-case (worst level of service) intersections in the afternoon peak hour: Adams Street at TH 22 and CR 3 at TH 22.

The “sidewalk averaging” technique was used to calculate worst-case intersection CO concentrations at both intersections. Modeling “sidewalks” are located adjacent to each approach leg and departure leg at the location closest to the vehicles stopped at the traffic signal. Each sidewalk location is represented by two receptors: one receptor 10 meters

from the intersection and one receptor 50 meters from the intersection. In this method, the CO concentrations from the two receptors are averaged. The worst case wind direction (of the 36 directions modeled) for each pair of sidewalk receptors was used to determine the maximum concentration for each pair of sidewalk receptors. The reported result is the maximum concentration for all of the sidewalks.

Carbon monoxide concentrations modeled for afternoon peak traffic volumes are shown in Table 2. The CO concentrations shown are the predicted maximum CO concentrations taken from the results of all modeled wind angles (0 – 360 degrees).

Table 22-2. Carbon Monoxide Modeling Results

Intersection	Analysis Year	Modeled Concentration (ppm)		Total (Modeled and Background) Concentration (ppm)		
		1-Hour	8-Hour	1-Hour	8-Hour	Wind Direction
Adams Street at TH 22	2009	2.9	2.0	6.3	4.3	200
CR 3 at TH 22		2.4	1.7	5.8	4.0	170
Adams Street at TH 22	2025	3.1	2.2	8.5	5.8	20
CR 3 at TH 22		3.4	2.4	8.8	6.0	290

Summary of Carbon Monoxide Results

Predicted carbon monoxide concentrations adjacent to the two worst-case intersections in the Project area are below federal and state standards. Because the other intersections in the area that were not analyzed operate better in terms of total volume, delay and level of service, the analyzed intersections represent the highest expected carbon monoxide concentration in the project area.

23. Stationary source air emissions.

Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

Stationary source air emissions. *This item is not applicable to an AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.*

The EQB guidance indicates that no response is necessary in an AUAR for this question.

New buildings constructed at the Project site will likely be heated by natural gas mechanical systems. The projected emissions from such systems will include small amounts of carbon dioxide, nitrous oxides, and very small amounts of other byproducts. All emissions are expected to be below thresholds for new source permitting. Effects on air quality from the project are expected to be negligible. All tenants will be required to obtain any required air emission permits.

24. Odors, noise and dust.

Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No
If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

Dust, odors, noise. *Dust, odors, and construction noise need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any dust control or*

construction noise ordinances in effect. If the area will include or adjoin major noise sources a noise analysis is needed to determine if any noise levels in excess of standards would occur, and if so, to identify appropriate mitigation measures. With respect to traffic-generated noise, the noise analysis should be based on the traffic analysis of item 21.

The EQB guidance indicates that dust, odors, and construction noise need not be addressed in an AUAR, unless there is some unusually reason to do so. Minor temporary odors may occur from heavy equipment resulting from construction activities. The nearest sensitive receptors are the residential subdivision northwest of the Project of the site and various homesteads within the Project boundaries and scattered around the area.

Dust and noise common to road development will be generated during the construction activities. Equipment used in the daily operations will be muffled. Erosion control measures will be put into place to mitigate dust from areas with no vegetation. Water will be applied as necessary as well as routine street cleaning for dust/mud control.

Noises common to building construction will be generated during construction of individual building projects. Construction activities will be conducted in conformance with the City's noise ordinance. Noise from construction activities will be limited to 6:30 am to 6:30 pm weekdays, with Saturday hours limited to 7:30 am to 4 pm. No construction will occur on Sundays.

A technical memorandum was prepared by SRF Consulting to document the methods and results of an assessment of future (2009 and 2025) noise that would be generated by vehicles Trunk Highway (TH) 22, U.S. Highway (USH) 14, and County-State Aid Highways (CSAH) surrounding the proposed Project. Existing (2002) noise levels, year 2009 and 2025 No-Build noise levels, and year 2009 and 2025 Build noise levels were analyzed.

Background

Following project construction, the potential sources of noise from the Project are limited to traffic noise. Traffic is regulated in Minnesota by the Minnesota Pollution Control Agency (MPCA) under Minnesota Statute 116.07 Subdivisions (Subd.) 2 and 4.

The proposed project is located in a rural setting adjacent to the developed setting of the City of Mankato. Adjacent land uses consist of rural/agricultural, commercial, and industrial uses. East of TH 22 is residential land uses. High volume roads adjacent to the proposed project include USH 14 and TH 22. Vehicle traffic is the major source of noise in the project area.

Future roads include the construction of a new four-lane County State Aid Highway (CSAH) 12 connection from CSAH 3 through the Project area to USH 14. Included in this connection is a new full-access interchange with USH 14. This future road was considered in the noise analysis for the year 2025 with (Build) and without (No Build condition) completion of the project.

A noise analysis was completed to assess existing noise levels in the project area and to determine what effect the proposed project would have on future noise levels. The analysis consisted of monitoring existing noise levels and predicting future noise levels using computer modeling.

Noise is defined as any unwanted sound. Sound travels in a wave motion and produces a sound pressure level. This sound pressure level is commonly measured in decibels. Decibels represent the logarithmic measure of sound energy relative to a reference energy level. For highway traffic noise, an adjustment, or weighting, of the high- and low-pitched sounds is made to approximate the way that an average person hears sounds. The adjusted sound levels are stated in units of "A-weighted decibels" (dBA). A sound increase of three dBA is barely perceptible to the human ear, a five dB increase is clearly noticeable, and a 10 dBA increase is heard twice as loud. For example, if the sound energy is doubled

(e.g. the amount of traffic doubles), there is a three dBA increase in noise, which is just barely noticeable to most people. On the other hand, if the source of the sound increases to where there is 10 times the sound energy level over a reference level, then there is a 10 dBA increase and it is heard as twice as loud.

In Minnesota, traffic noise impacts are evaluated by measuring and/or modeling the traffic noise levels that are exceeded 10 percent and 50 percent of the time during the hour of the day and/or night that has the heaviest traffic. These numbers are identified as the L10 and L50 levels. The L10 value is compared to the Federal Highway Administration (FHWA) noise abatement criteria.

The following chart provides a rough comparison of the noise levels of some common noise sources:

Sound Pressure Level (dBA)	Noise Source
140-----	Jet Engine (at 75 feet)
130-----	Jet Aircraft (at 300 feet)
120-----	Rock and Roll Concert
110-----	Pneumatic Chipper
100-----	Jointer/Planer
90-----	Chainsaw
80-----	Heavy Truck Traffic
70-----	Business Office
60-----	Conversational Speech
50-----	Library
40-----	Bedroom
30-----	Secluded Woods
20-----	Whisper

Source: "A Guide to Noise Control in Minnesota," Minnesota Pollution Control Agency, <http://www.pca.state.mn.us/programs/pubs/noise.pdf> and "Highway Traffic Noise," FHWA, <http://www.fhwa.dot.gov/environment/htnoise.htm>.

Along with the volume of traffic and other factors (i.e., topography of the area and vehicle speed) that contribute to the loudness of traffic noise, the distance of a receptor from a sound's source is also an important factor. Sound levels decrease as distance from a source increases. The following rule of thumb regarding sound decreases due to distance is commonly used: "Beyond approximately 50 feet, each time the distance between a line source (such as a road) and a receptor is doubled, sound levels decrease by three decibels over hard ground, such as pavement or water, and by four and one half decibels over vegetated areas."

Minnesota State noise standards have been established specifically for daytime and nighttime periods. For residential land uses (Noise Area Classification 1 or NAC-1), the Minnesota State standards for L10 are 65 decibels for daytime and 55 decibels for nighttime; the standards for L50 are 60 decibels for daytime and 50 decibels for nighttime. State noise standards are depicted in Table 1.

County, township, and city roads without access control outside of the cities of Minneapolis and St. Paul are exempt from the state noise standards, per Minnesota statutes Section 116.07 Subd. 2a. Therefore, all county, township, and city roads within the project area are exempt from state noise standards. TH 22 and USH 14 are regulated under state noise standards. Minnesota state noise standards are shown in Table 1; the standards are presented for comparison purposes only.

Table 24-1. Minnesota State Noise Standards

MPCA State Noise Standards					
Land Use	Code	Day (7 am—10 pm) dBA		Night (10 pm—7 am) dBA	
Residential	NAC-1	L ₅₀ of 65	L ₅₀ of 60	L ₅₀ of 55	L ₅₀ of 50
Commercial	NAC-2	L ₅₀ of 70	L ₅₀ of 65	L ₅₀ of 70	L ₅₀ of 65
Industrial	NAC-3	L ₅₀ of 80	L ₅₀ of 75	L ₅₀ of 80	L ₅₀ of 75

Because federal funds may be used for the construction of the CSAH 12 extension and interchange with USH 14, federal noise criteria would apply when considering thresholds for consideration of noise abatement measures. This road and interchange was considered as part of the year 2025 noise analysis. For residential uses (Federal Land Use Category B), the Federal L10 standard is 70 dBA for both daytime and nighttime. Locations where noise levels are “approaching” (defined as being within one decibel of the criterion threshold, i.e., 69 dBA) or exceeding the criterion level, must be evaluated for noise abatement reasonableness. Federal Noise Abatement Criteria (NAC) are shown in Table 2; the standards are presented for comparison purposes only.

Table 24-2. Federal Noise Abatement Criteria

FHWA Noise Abatement Criteria		
Category	L₁₀ dBA	Land Use
A	60	Special areas requiring serenity
B	70	Residential and recreational areas
C	75	Commercial and industrial areas
D	NA	Undeveloped areas
E	55*	Residential, hospitals, libraries, etc.

*Applies to interior noise levels. All other land uses are exterior levels.

In addition to the identified noise criteria, the Federal Highway Administration (FHWA) also defines a noise impact as a “substantial increase” in the future noise levels over the existing noise levels. The Minnesota Department of Transportation (Mn/DOT) considers an increase of five dBA or greater a substantial noise level increase.

Noise Level Monitoring

Noise level monitoring is commonly performed during a noise study to document existing noise levels. Existing noise levels can be used as a “baseline” against which future scenarios are compared. In addition, when studying future noise levels projected by computer models, monitored noise levels for existing conditions are compared to modeled results for existing conditions to validate the computer modeling techniques and results.

Existing noise levels were monitored at one site in the project area, chosen to represent areas of outdoor human activity, i.e., residential yards (Receptor 2 shown in Figure 1, Appendix E—Traffic, Air & Noise Analysis). Noise levels were monitored on June 2, 2005 (nighttime peak hour, 6:00 am to 7:00 am). Monitoring methods used in this study comply with state and federal guidelines. A trained noise monitoring technician was present at each session for the entire monitoring session to ensure correct operation of the instrumentation.

Noise monitoring results for Receptor R-2 are presented in Table 3. Monitoring results are presented along with the results of computer modeling for existing daytime and nighttime noise conditions. The monitored L₁₀ noise levels (L₁₀=67 dBA) during the nighttime peak period are within 3 decibels of the modeled L₁₀ levels (L₁₀=70 dBA), thereby validating the model.

Noise Level Modeling

Identification of Residential Receptors

The proposed project will replace agricultural land use with industrial and commercial uses. The proposed project does not include any residential uses. However, there are existing residential receptors surrounding the project area. Residential areas are considered to be more sensitive to potential traffic noise impacts than commercial and industrial land uses and have a lower state noise standard; therefore nine noise modeling receptors were selected to represent existing residential sites surrounding the AUAR project area. A hotel is located at the northeast quadrant of the TH 22/USH 14 interchange. Hotels are also considered to be more sensitive to commercial and industrial land uses; therefore this site was identified as an additional receptor location.

Receptor locations are shown on Figure 1—Appendix E. All receptor sites are classified within the definition of State of Minnesota NAC-1 and Federal Land Use Category B (see Tables 1 and 2).

Prediction of Future Noise Levels

Traffic noise impacts were assessed by modeling noise levels at receptor sites (i.e., residences) likely to be most affected by changes in roadway alignment and traffic volumes resulting from construction of the proposed project.

Noise modeling was done using the noise prediction program “MINNOISE”, a version of the FHWA “STAMINA” model adapted by Mn/DOT. This model uses vehicle numbers, speed, class of vehicle, and the typical characteristics of the roadway being analyzed. Posted speed limits were used to model all roads.

Noise levels were modeled for both the L_{10} and L_{50} levels for daytime and nighttime peak traffic hours. Forecast year 2009 and year 2025 peak hour traffic volumes, under land use scenario B, which are representative of the worst-case traffic volume levels and, subsequently, the worst-case noise levels, were used to model future noise levels.

The traffic mix data (percent of trucks) used in the noise modeling was 10 percent medium trucks and 10 percent heavy trucks. This truck percentage was assumed for the model based on the future land uses anticipated for the industrial service area and a worst-case scenario of future truck volumes traveling to and from the study area.

Noise Level Modeling Results

Noise monitoring and modeling results for existing residential receptors for existing (year 2002) conditions and for year 2009 are presented in Tables 3 and 4. Both daytime and nighttime L_{10} and L_{50} noise levels are shown. Year 2009 noise levels are shown under the No-Build condition and with implementation of the proposed project.

Noise monitoring and modeling results for existing residential receptors for existing (year 2002) conditions and year 2025 conditions are presented in Tables 5 and 6. Both daytime and nighttime L_{10} and L_{50} noise levels are shown. Year 2025 noise levels are shown for the No-Build condition and with implementation of the proposed project and the planned CSAH 12/USH 14 interchange.

Existing L_{10} traffic noise levels surrounding the project area are above state daytime (and nighttime) standards. Existing L_{10} noise levels are discernibly higher than state standards at receptor locations (R1, R2, R8, R10) adjacent to high volume/high speed roadways in the project area (e.g., USH 14; TH 22). These traffic noise levels are also a result of high volume of high speed, heavy truck traffic on area roadways.

Table 24-3. Noise Monitoring and Modeling Results—Daytime (Year 2009)

Receptor*	Existing (2002)		2009 No Build		Difference Between Existing (2002) and 2009 No Build		2009 Build		Difference Between Existing (2002) and 2009 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (1)*	77	69	79	72	2	3	79	75	2	3
R2 (1)	77	70	79	72	2	2	79	75	2	3
R3 (1)	64	57	67	60	3	3	67	61	3	4
R4 (1)	66	54	73	63	7	9	74	64	8	10
R5 (1)	55	52	57	54	2	2	58	55	3	3
R6 (2)	68	57	73	64	5	7	74	66	6	9
R7 (1)	72	63	74	66	2	3	75	68	3	5
R8 (1)	74	69	76	71	2	2	76	72	2	2
R9 (4)	63	59	65	61	2	2	65	61	2	2
R10 (1)	76	66	78	69	2	3	78	69	2	3
State Standards	65	60	65	60			65	60		
Federal Criteria	70	-	70	-			70	-		

Bold numbers are above state standards.

Table 24-4. Noise Monitoring and Modeling Results—Nighttime (Year 2009)

Receptor*	Existing (2002)		2009 No Build		Difference Between Existing (2002) and 2009 No Build		2009 Build		Difference Between Existing (2002) and 2009 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (1)*	72	63	75	66	3	3	75	66	3	3
R2 (1)	73	64	75	66	2	2	75	66	2	2
R3 (1)	60	51	63	55	3	4	63	55	3	4
R4 (1)	61	48	68	57	7	9	69	58	8	10
R5 (1)	51	47	53	49	2	2	54	50	3	3
R6 (2)	63	52	68	58	5	6	70	60	7	8
R7 (1)	67	57	69	60	2	3	71	62	4	5
R8 (1)	70	64	72	66	2	2	72	66	2	2
R9 (4)	59	54	61	56	2	2	61	56	2	2
R10 (1)	71	61	73	63	2	2	73	63	2	2
State Standards	55	50	55	50			55	50		
Federal Criteria	70	-	70	-			70	-		

Bold numbers are above state standards.

Table 24-5. Noise Monitoring and Modeling Results—Daytime (Year 2025)

Receptor*	Existing (2002)		2025 No Build		Difference Between Existing (2002) and 2025 No Build		2025 Build		Difference Between Existing (2002) and 2025 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (1)*	77	69	80	73	3	4	80	74	3	5
R2 (1)	77	70	81	74	4	4	81	75	4	5
R3 (1)	64	57	69	63	5	6	69	64	5	7
R4 (1)	66	54	76	66	10	12	76	66	10	12
R5 (1)	55	52	60	57	5	5	62	60	7	8
R6 (2)	68	57	78	71	10	14	79	73	11	16
R7 (1)	72	63	79	73	7	10	81	76	9	13
R8 (1)	74	69	77	74	3	5	78	74	4	5
R9 (4)	63	59	67	64	4	5	67	64	4	5
R10 (1)	76	66	80	73	4	6	80	72	4	6
State Standards	65	60	65	60			65	60		
Federal Criteria	70	-	70	-			70	-		

Bold numbers are above state standards.

Table 24-6. Noise Monitoring and Modeling Results—Nighttime (Year 2025)

Receptor*	Existing (2002)		2025 No Build		Difference Between Existing (2002) and 2025 No Build		2025 Build		Difference Between Existing (2002) and 2025 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (1)*	72	63	75	67	3	4	76	68	4	5
R2 (1)	73	64	76	69	3	5	77	70	4	6
R3 (1)	60	51	64	57	4	6	65	59	5	8
R4 (1)	61	48	68	56	7	8	69	58	8	10
R5 (1)	51	47	56	52	5	5	58	55	7	8
R6 (2)	63	52	73	65	10	13	75	67	12	15
R7 (1)	67	57	75	67	8	10	77	70	10	13
R8 (1)	70	64	73	69	3	5	74	69	4	5
R9 (4)	59	54	63	59	4	5	63	59	4	5
R10 (1)	71	61	76	67	5	6	75	66	4	5
State Standards	55	50	55	50			55	50		
Federal Criteria	70	-	70	-			70	-		

Bold numbers are above state standards.

**number in () in this column is the number of residences represented by receptor*

Increases in traffic along project area roadways between existing conditions and year 2009 would result in both No-Build and Build daytime traffic noise being barely noticeable (2 to 3 dBA) at some receptors and discernibly higher (7 to 8 dBA) at one receptor location. Traffic volume increases would result in similar increases for both No-Build and Build nighttime traffic noise.

Increases in traffic along project area roadways between existing conditions and year 2025 would result in both No-Build and Build daytime traffic noise being noticeable (3 to 5 dBA) at some receptors and discernibly higher (7 to 10 dBA) at three receptor locations under the no-build condition. Traffic noise would be discernibly higher (7 to 11 dBA) at four receptor locations under the Build condition. Traffic volume increases would result in similar increases for both Bo-Build and Build nighttime traffic noise.

Conclusions

Traffic noise levels (daytime and nighttime) were modeled at 10 receptors surrounding the project area. The number of receptors surrounding the project area over state daytime and

nighttime standards (L_{10}) is summarized in Table 7.

Table 24-7. Summary of Noise Modeling Results

Type of Impact	Existing (2002)	Year 2009 Conditions		Year 2025 Conditions	
		No-Build	Build	No-Build	Build
Receptors Over State Daytime Standards (L_{10})	8	8	8	9	9
Receptors Over State Nighttime Standards (L_{10})	9	9	9	10	10

Existing traffic noise levels are over state standards (daytime and nighttime) surrounding the project area. Results of this analysis indicate that future noise levels (year 2009 and 2025) will exceed state standard daytime and nighttime noise levels near roadways in the project area under both the No-Build and Build scenarios. Under existing (year 2002) conditions, 8 of the 10 modeled receptors exceed state L_{10} noise standards. By year 2025, 9 of the 10 modeled receptors would exceed state L_{10} noise standards. This is not uncommon for residential receptors located adjacent to major roadways.

The difference between existing daytime L_{10} noise levels and year 2025 daytime L_{10} noise levels ranges from 3 to 5 dBA for most receptors, with three receptors experiencing increases of 7 to 10 dBA under the No-Build scenario and four receptors experiencing increases of 7 to 11 dBA under the Build scenario. This increase is due to expected traffic growth in the project area.

Receptor 6 is located within the boundaries of the Project area. Although this is currently a residential receptor, land uses for the proposed development area are commercial and industrial. The state NAC for these land uses are higher than for residential receptors (refer to Table 24-1). In years 2009 and 2025, noise levels will be above NAC-2 (commercial) state noise standards but below NAC-3 (industrial) state noise standards within the boundaries of the Project area. Local streets within the development are exempt from state standards and noise mitigation measures are typically not constructed within commercial areas (i.e., restricted visibility of commercial property from roadways); therefore on-street mitigation is not proposed as part of this Project.

25. Nearby resources.

Are any of the following resources on or in proximity to the site?

Archaeological, historical or architectural resources? ☒ Yes ☐ No

Prime or unique farmlands or land within an agricultural preserve? ☒ Yes ☐ No

Designated parks, recreation areas or trails? ☒ Yes ☐ No

Scenic views and vistas? ☐ Yes ☒ No

Other unique resources? ☐ Yes ☒ No

If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

Sensitive resources: Archeological, historic, and architectural resources. For an AUAR, contact with the State Historic Preservation Office is required to determine whether there are areas of potential impacts to these resources. If any exist, an appropriate site survey of high probability areas is needed to address the issue in more detail. The mitigation plan must include mitigation for any impacts identified. Prime or unique farmlands. The extent of conversion of existing farmlands anticipated in the AUAR should be described. If any farmland will be preserved by special protection programs, this should be discussed. Designated parks, recreation areas, or trails. If development of the AUAR will interfere or change the use of any existing such resource, this should be described in the AUAR. The RGU may also want to discuss under this item any proposed parks, recreation areas, or trails to be developed in conjunction with development of the AUAR area. Scenic views and vistas. Any impacts on such resources present in the AUAR should be addressed. This would include both direct physical impacts and impacts on visual quality or integrity. "EAW Guidelines: contains a list of possible scenic resources (page 20).

Historic/Archaeological/Architectural Resources

Information was received from the Minnesota Historical Society Preservation Office (SHPO) (See Appendix C—State Historical Preservation Correspondence). A search was completed of the MN SHPO Architecture/History Database and the Archaeological Database. This information indicated the Project is not in proximity to archaeological resources. There are three sites listed on the History/Architecture Inventory. These sites are listed as ‘farmhouse’ which is listed in the NE-NE-NE quarter of section 10, Mankato Township, ‘Schueuer Farmstead’ off Co. Hwy 3 in the SW-NE-NW quarter of Section 11, Mankato township, and ‘District School No. 55’ located in the NW-NW-N quarter of section 11, Mankato Township. The result of this database search does not include an assessment for archaeological site potential, or provide a listing of all potential historic architectural properties. It represents only known and recorded archaeological sites and historic architectural properties from the current SHPO databases that may be historically significant. However, it is unknown whether these resources are architecturally/historically significant today because of possible alterations to the structure, reconstruction or demolition of significant resources, or from degradation over time which would decrease the historical significance of a property.

Prime Farmland

Approximately 73.2% of the site is considered prime farmland soils according to the Blue Earth County Soil Survey (see Exhibit J—Prime Farmland Map). The site is not considered part of an agricultural preserve nor is it considered unique farmland. The NRCS defines prime farmlands as:

“Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. These soils have the quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.”

No farmland preservation measures have been considered. The site is guided for development; therefore no clear alternatives to conversion of prime farmland are readily identifiable. The Land Use Plan is intended to guide that growth through thoughtful, planned development of the City. The City created the Land Use Plan and defined a growth area outside the city limits based on the ability to service future growth. The purpose of a land use plan is to encourage planned, compact, contiguous development that efficiently uses land and the existing and proposed infrastructure. The Land Use Plan outlines agricultural preservation areas and defining boundaries for future growth. This plan also helps protect the outlying agricultural/rural areas from unplanned, scattered urban growth. Blue Earth County also has controls to promote development where it can be sustained with public infrastructure services. This, in turn, protects the environment and deters fragmentation of agricultural areas by non-agricultural land uses.

Rural areas and agricultural practices are important, not only to the character of the area, but to the vitality of the economy. It is in the City’s best interest to take reasonable steps to ensure the rural and agricultural quality of life, while also trying to take a responsible approach to urban development. In consideration of the growth projections and land-use goals, the Project is consistent with the Comprehensive Plan.

In 1999 the County adopted a “Right to Farm” ordinance and implemented an agricultural zone disclosure statement to be signed by non-farm developers. This disclosure form becomes a part of each parcel’s official file. Setback standards are included in the agricultural district performance standard section. The Project site is within the County’s

Urban Service Overlay District which requires any development contained within the district be connected to urban utilities.

Parks, Recreational Areas, Trails

The Sakatah Singing Hills State Trail borders the Project site to the north. According to the Minnesota Department of Natural Resources, the trail is a 39-mile multiple use paved trail from Mankato to Faribault which has been developed on an abandoned railroad grade. The trail lies in the transition zone between what was once the Big Woods and the vast prairies. The trail has been developed for bicycling, hiking, in-line skating, horseback riding, skiing, and snowmobiling. It begins at Lime Valley Road near Mankato and ends east of Interstate 35 at Faribault. The existing condition of the trail in the location of where the trail meets CSAH 12 and the DM&E Railroad has been a problem in the past. As part of the City's Park & Open Space Master Planning process during a public workshop in November 2001, comments were received that focused on this location and the trail access problems in this area. Comments were also received that included recommendations regarding the addition of picnic areas in the area. One comment stated, "The first mile is part of the 15-20 year annexation area and should be looked at for park area."

There are no designated parks located within the vicinity of the Project site. According to the map titled 'Park & Open Space Plan' in the City of Mankato's Park & Open Space Master Plan, the Project area is in need of a future community park.

Mitigation

As part of the mitigation plan, sections of the Project area will be utilizing and set aside for a regional community park. During stormwater planning, all opportunities to provide stormwater facilities along park corridors will be identified. The Sakatah Trail also has the potential to be re-routed to help the access problems in the area. The City will reserve land within the Project area for recreational and open space opportunities, prior to development.

26. Visual impacts.

Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? Yes ☒ No
If yes, explain.

Adverse visual impacts. *If any non-routine visual impacts would occur from the anticipated development, this should be discussed here along with appropriate mitigation.*

This Project will not create adverse visual impacts from non-routine development.

27. Compatibility with plans and land use regulations.

Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency?

✓ Yes No. If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

Compatibility with Plans. *The AUAR must include a statement of certification from the RGU that its comprehensive plan complies with the requirements set out at 4410.3610, subpart 1. The AUAR document should discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to items 6,9,18,21, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for any of the development scenarios should be noted. If there are any management plans of any other local, state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the various development scenarios studied, with emphasis on any incompatible elements.*

A resolution was signed by the Mankato City Council (see Appendix A—Resolution to initiate the AUAR process) stating the land use scenarios for the Project depict anticipated development for the area. This resolution also certifies that the City has a Comprehensive

Plan required by MN Rules 4410.3610, subpart 1, which includes:

- A. A landuse plan designating the existing and proposed location, intensity, and extent of use of land and water for residential, commercial, industrial, agricultural, and other public and private purposes.
- B. A public facilities plan describing the character, location, timing, sequence, function, use, and capacity of existing and future public facilities of the local governmental unit. The public facilities plan must include at least the following parts:
 - (1) a transportation plan describing designating, and scheduling the location, extent, function, and capacity of existing and proposed local public and private transportation facilities and services; and
 - (2) a sewage collection system policy plan describing, designating, and scheduling the areas to be served by the public system, and the standards and conditions under which the installation of private sewage treatment systems will be permitted.
- C. An implementation program describing public programs, fiscal devices, and other actions to be undertaken to implement the comprehensive plan. The implementation plan must include a description of official controls addressing the matters of zoning, subdivision, and private sewage treatment systems, a schedule for the implementation of those controls, and a capital improvements program for public facilities.

Land Use Scenario B (See Exhibit E₂—Land Use Scenario B) is compatible with the City of Mankato's Comprehensive Plan. This scenario includes commercial, industrial, and open space land use. Land Uses Scenario A (See Exhibit E₁—Land Use Scenario A) is very similar to Scenario B, however sub-district A is depicted as industrial land use.

This plan is also consistent with Blue Earth County's Comprehensive Plan. This Project will also comply with the Orderly Annexation Agreement with Mankato Township and a joint resolution for annexation from Mankato Township into the City of Mankato will need to be submitted.

Blue Earth County's goals for Urban Development states, "Urban growth pressure is being applied in many areas of Blue Earth County. It is in the best interest of the county to limit the development of uses that may eventually require the extension of urban utilities. The County supports orderly growth out from urban areas with urban utility services."

This Project is currently located in Mankato Township. This area will be annexed prior to the Project start date. The Township has given the City of Mankato permission to act as the RGU for this Project.

The Mankato Township Orderly Annexation Agreement was adopted on February 3, 1995 and is effective until 2015. The agreement is in place to manage an orderly growth process and prohibit new non-farm development (new residential subdivisions, commercial and industrial development) within the township. New development would have to be annexed into the city and serviced by municipal utilities. Property owners have to petition the City to annex their property and the City cannot force annexation of property into city limits.

According to the City of Mankato's Land Use Plan, this Project is consistent with the City's projected land use (See Exhibit D—Existing Landuse Plan). This Project will also meet all City zoning ordinances and long-range planning goals. Recommendations regarding land use, transportation, and park and open space will be followed during the design phases of development.

28. Impact on infrastructure and public services.

Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project?
☒ Yes ☐ No. If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

Impact on infrastructure and public services. This item should first of all summarize information on physical infrastructure presented under items (such 6, 17, 18 and 21). Other major infrastructure or public services not covered under other items should be discussed as well — this includes major social services such as schools, police, fire, etc. The RGU must be careful to include project-associated infrastructure as an explicit part of the AUAR review if it is to exempt from project-specific review in the future.

To accommodate this Project, public and private infrastructure improvements will be constructed in this area in association with development. The utilities that will be extended to this area include sanitary sewer, water, storm drainage, telephone, electricity, and natural gas. New road construction and existing road improvements will also be associated with this Project. The new or expanded infrastructure will result in increased maintenance for the City and utility providers in the future.

The development of this site will be utilizing the City of Mankato's public water supply and wastewater treatment facilities. Infrastructure related to communications, electricity, and natural gas (Dry Utilities) will be provided through private companies.

Dry Utilities

Communications

Communications, including telephone, for the Project will be provided by the local Hickorytech office located on Augusta Drive approximately 3,000 feet away from the western edge of the project boundary (See Exhibit P—Private (Dry) Utilities Plan). There is an existing conduit and manhole system from this office up to and along the south side of CSAH 3 installed up to the western edge of the Project. This system has a 600 pair cable and 96 fiber optical cable available to service the area. This conduit and manhole system will likely be extended into at the same time improvement construction occurs on CSAH 3. The existing communication infrastructure is anticipated to be sufficient to service the Project. However if additional service is needed, the system could be improved without obtrusive construction due to the conduit manhole system. Additionally, there is rural system 150 pair cable located on the north side of CSAH 3. This system reduces to a 50 pair system through the area and would likely be needed or utilized, but is available.

Electrical Service

Excel Energy has the capability to supply the industrial service area from a modern substation located south of US-14 (See Exhibit P—Private (Dry) Utilities Plan). This substation will be upgraded in 2005 to convert it from a 65kv to 115kv system. This will be sufficient to provide electrical service to the entire Project area. The electrical system will be constructed with redundancy to provide backup in case of interruption to the primary service.

Natural Gas Service

Centerpoint Energy gas pipeline is currently available east of the Project area located in both the southern right of way of CSAH 3 and Excel Drive. Natural gas service would be extended from both locations to the Project. Currently, this line is a 20 psi line which will be sufficient to supply the industrial service area through the first phase of development and beyond depending on the type of users that eventually occupy the area. If additional capacity becomes necessary, Centerpoint Energy has committed to upgrading the supply line from a 20 psi to a 50 psi line.

Major Social Services

An increase of public services is anticipated to accommodate the Project. Fire protection is a high priority public service for industrial land use. The City is planning to construct a new

fire station in the area to better provide fire protection. The Project area is the proposed target area to be serviced by the new fire station. The City's Capital Improvement Plan indicates the new fire station will be constructed in 2007.

Schools will not be directly impacted as a result of this project. Indirectly, as the Project area develops, additional jobs will be available, and local schools may be affected by general population growth.

Road improvements

Road construction and improvements will occur as a result of this Project. New internal road alignments have been determined for future Technology Drive extension, future Power Drive and future Sohler Drive (See Exhibit L—Transportation Plan). Additional roads will be necessary, but the layout and locations have not been determined.

Internal Road Improvements

The City has scheduled for construction in 2005 the extension of Technology Drive east to the future intersection with Power Drive and the construction of Power drive from this intersection north to CSAH 3.

County State Aid Highway 3

Blue Earth CSAH 3 will be improved to accommodate increased traffic due to the construction of this project. Currently CSAH 3 is a typical rural section two lane paved County State Aid Highway through the study area. CSAH 3 has been improved to a typical four lane urban section with curb and gutter west of the site. The upgrade will continue this urban section road and lane capacity east through the Project. The construction of the improvements will begin this fall from the existing improved road section east to the rail road crossing. This is anticipated to accommodate development of the Project through 2009.

County State Aid Highway 12 Extension

CSAH 12 will eventually be extended through the industrial service area intersecting with US 14 and continuing south. As part of the CSAH 12 extension project a new interchange at US 14 will be constructed. Currently this is scheduled to be constructed in starting 2015. Currently CSAH 12 is oriented east/west, north of the future industrial site where it intersects TH 22. CSAH 12 then turns north/south and extends past the Mankato Municipal Airport. The construction of an additional interchange is part of the mitigation plan to accommodate the additional traffic this project will produce when fully constructed.

Highway 14 Interchange

The City has contracted SRF Consulting, Inc. to conduct a preliminary study of the proposed new interchange. Currently SRF is studying four conceptual layouts of the interchange and the extension of CSAH 12 (See Appendix E—Transportation, Air, Noise Analysis).

- Concept 1: Compressed diamond on the north side with a traditional diamond to the south.
- Concept 2: Compressed diamond on the north side with a folded diamond on the southeast corner.
- Concept 3: Folded diamond on the northwest corner and a traditional diamond to the south.
- Concept 4: Folded diamond on the northwest and southeast corners.

Environmental review of the interchange project will occur separate from this report. For the purposes of this environmental review the interchange is considered part of the mitigation plan for traffic impacts due to the construction of the Project.

Details for the area have not been finalized at the time of this report, and the plans outlined

in this document are only conceptual in nature.

29. Cumulative impacts.

Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (*or discuss each cumulative impact under appropriate item(s) elsewhere on this form*).

Cumulative impacts. *This item does not require a response for an AUAR with respect to cumulative impacts of potential developments within the AUAR boundaries, since the entire AUAR process is intended to deal with cumulative impacts from related developments within the AUAR area; it is presumed that the responses to all items on the EAW form encompass the impacts from all anticipated developments within the AUAR area. However, the questions of this item should be answered with respect to the cumulative impacts of development within the AUAR boundaries combined with past, present, and reasonably foreseeable future projects outside of the AUAR area, where such cumulative impacts may be potentially significant. (As stated on the EAW form, these cumulative impact descriptions may be provided as part of the responses to other appropriate EAW items, or in response to this item).*

This item does not require a response for an AUAR according to EQB guidelines since the entire AUAR process deals with cumulative impacts from related developments within the AUAR area. However, additional information on cumulative impacts of development within the AUAR boundaries combined with past, present, and reasonably foreseeable future projects outside of the AUAR area have been outlined in this section.

One area this AUAR does not address deals with the cumulative effects associated with sprawl and suburbanization. This can have both positive and negative cumulative effects socially and environmentally. Determining the full effect of cumulative impact is more intuitive than quantifiable. Some of the cumulative effects that can be observed from the expansion of this Project are loss of agricultural land, loss of open space, fragmentation of wildlife habitat, and loss of a rural sense of place.

There is a competing issue with the goals of many communities in balancing development with agricultural needs, open space, and natural resources while trying to retain a sense of place. Sprawl has become an issue in many areas, and is only becoming a larger issue because of the need to preserve natural areas and open space. Through these competing issues, many environmental resources, former open spaces and farmland have decreased and infrastructure costs of roads and sewer system extensions have increased.

The City understands how important rural areas and agricultural practices are, not only to the character of the area, but to the vitality of our economy. The City is trying to take reasonable steps to ensure the rural and agricultural quality of life and to preserve agricultural land, open space and wildlife habitat while also trying to take a responsible approach to urban development. In consideration of the City's growth projections and land-use goals, the Project is consistent with the Comprehensive Plan. Blue Earth County also has controls to promote development where it can be sustained with public infrastructure services. This, in turn, protects the environment and deters fragmentation of agricultural areas by non-agricultural land uses.

The City of Mankato is a very proactive community in terms of cumulative impacts in comparison to surrounding towns and other similar-sized cities in the State. The City of Mankato is a regional hub for most of the south and southcentral portions of Minnesota. Mankato has experienced significant growth since the town was established, especially through the 1970s-80s. Mankato has used a proactive approach to development in order to decrease the negative cumulative effects to the environment and population of the area which can stem from a reactive approach to infrastructure planning and development.

Infrastructure and cumulative impact assessments have previously been completed for Mankato, therefore, only minor mitigation efforts are shown in the AUAR. Mankato has laid the framework for this Project specifically, taking into account the cumulative effects of development in the Project boundary and in the Project area in order to plan for future and current infrastructure projects.

Transportation Impacts

Consideration of direct, indirect, and cumulative impacts (or effects) of a development is important considering the increase in traffic and public transportation infrastructure. While direct impacts are easier to identify, indirect and cumulative impacts are more difficult. Direct impacts are caused by the action and occur at the same time and place as a specific project. Indirect impacts are associated with a project and occur later in time or farther removed in distance; but they are still reasonably foreseeable such as induced land development from highway projects. Cumulative impacts, on the other hand, result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable actions, regardless of the agency or person initiating the other actions. Where indirect impacts are specifically related to a transportation project and can occur from induced development, cumulative impacts are the result of other present and future development actions.

The City of Mankato has taken many steps to plan for the cumulative impacts associated with the transportation system. A planning study called the Mankato Area Transportation and Planning Study (MATAPS) was completed in 1996 after the first studies were undertaken in the early 1970s by six governmental agencies: MnDOT, Blue Earth County, Nicollet County, the City of Mankato, the City of North Mankato, and the Region Nine Development Commission. This partnership provided a platform from which long-range regional and cumulative impacts, goals and policies were developed. Further, the AUAR has addressed both direct and indirect transportation issues through a detailed air, noise and traffic analysis completed by SRF Consulting.

To address additional cumulative impacts related to transportation and traffic, need for an AUAR for this Project area is the cumulative result of upgrades to Hwy 14 occurring from Nicollet to Rochester. Hwy 14 is in the process of becoming a 4-lane road, and has seen an increase in traffic over the last years. The improvements to the Hwy 14 transportation system has appealed to industrial, commercial, and manufacturing business that utilize the roadway system. The area around the Project has seen rapid development as a result of these improvements. The City of Mankato is using the AUAR process to gain a better understanding of the environmental impacts associated with the cumulative effects of growth in the area.

Open Space/Cover Types/Corridors Impacts

The City of Mankato created a Parks & Open Space Plan in September, 2002. This plan takes a cumulative approach and is used as a tool to provide recreational activities as well as preserve sensitive natural resources. The Plan helps the City to ensure that investments made to parks and open space in the future are part of a greater whole, a complex interrelated system of wetlands, woodlands, recreation fields, trails, playgrounds and parkways, connecting to each other.

In accordance with the Open Space Plan and as stated in the AUAR, the majority of natural areas will remain intact and will provide habitat for area wildlife in order to decrease the cumulative impacts associated with the loss of these areas. Because the Project includes mostly disturbed areas, corridor impacts from this project compared to predevelopment conditions is minor. The City and MnDOT plan to protect most of the natural areas through conservation easements wherever possible.

Ground Water Impacts

Over pumping of the water supply system can cause decline of ground water levels in aquifers, local impacts on streams and wetlands, and the potential of necessary groundwater resources be made unavailable for future use. Long-term effects of depleting groundwater may include depletion of wetlands, streams, springs, and lakes, as well as ecological or other changes.

In order to create a sustainable system of water supply for Mankato, a dynamic equilibrium is sought that approximately balances recharge, discharge, and withdrawals of groundwater.

The City of Mankato appropriates water from a combination of sources. One source includes multiple wells constructed into the Mt. Simon Hinckley Aquifer, and the second source is a Ranney vertical caisson with horizontal collector lateral. Mt Simon-Hinckley Aquifer is the deepest aquifer in the area and has limited recharge. This aquifer is protected for potable water purposes and restricts new uses. New uses are only allowed if there are no other alternatives and when conservation measures are being implemented. The City of Mankato is in the process of improving their water supply system with the addition of two new wells. Because of the protections to this aquifer, the City of Mankato (since the AUAR draft publication) has found alternative sources of water and has proposed to drill two wells into the Ranney vertical caisson with horizontal collector laterals instead of a well into the Mt. Simon-Hinckley Aquifer.

Horizontal wells are constructed by installing a vertical caisson into the ground, then pushing horizontal collector laterals out from the bottom of the caisson. In this type of well, the materials above the collector laterals remain undisturbed. Ranney Collectors are one type of horizontal well. Because they are typically shallow and located close to a surface water body with the intent of capturing water in alluvial aquifers, they are also considered a source of groundwater at risk from contamination by relatively large waterborne pathogens passing to the ground water collector from surface water. What this means, is that marginal water is utilized by the City for water supply and the water pumped and treated utilizing the facilities at the water treatment plant.

Water enters the plant at a hardness of four hundred and sixty parts per million gallons and is soften down to approximately one hundred and forty parts per million. The chemical used for the softening process is Lime. Coagulant chemicals are also utilized to assist the flocculation process. Phosphate, Fluoride, and Chlorine are also added to the water. The Water supply of Mankato is approved by the State of Minnesota and also by the Federal Government.

The city of Mankato has an ever-increasing need for water supply. In order to decrease negative cumulative impacts on surface and groundwater from general growth and population increases, the City is proposing to expand their horizontal collector lateral. Water from this source comes from horizontal collectors that run under the Minnesota River. The effects of growth and development on groundwater levels generally lag behind the growth or development activities. For instance, as land is converted to urban use with storm sewers and paved surfaces or as drainage is redirected from wetlands to ditches for increased agricultural production, the patterns of ground water recharge are altered or interrupted. This decreases the amount of water that infiltrates into the ground to replenish the aquifers. Wetland restoration and preservation is one management technique that can be used to reduce the redirection of precipitation and surface water runoff that might otherwise have recharged the ground water. Safeguarding the natural recharge process in this manner can have a long-term positive influence on water supplies. This Project and the City of Mankato has taken a planned approach to growth that considers the available water supply and water resource setting to minimize the impacts on both ground and surface water and human resources.

Sanitary Sewer Impacts

In order to create a sustainable system for Mankato, a dynamic equilibrium is sought that approximately balances recharge, discharge, and withdrawals of groundwater.

The city of Mankato has considered the cumulative impacts of wastewater treatment and has completed extensive master planning. The Wastewater Treatment Plant recently received an upgrade that greatly enhanced the quality of water entering the Minnesota River (the water entering the river is actually cleaner than the water pumped from water supply facilities) and is designed for use through the year 2020.

As stated in the AUAR, the City of Mankato is in partnership with Calpine Corporation who will be constructing and operating a new water reclamation facility adjacent to the City's existing WWTP. The effluent from the WWTP will enter Calpine's facility for additional treatment before being routed to Calpine's Mankato Energy Center, a power plant currently under construction. Calpine will use the reclaimed water for processing and cooling. Calpine's facility will be designed to provide two additional stages of treatment to wastewater. Surrounding cities, including Eagle Lake, are currently pumping their wastewater to the Mankato facilities, thereby decreasing the cumulative impacts of outlying areas by prohibiting less-treated wastewaters from entering waters of the State. Cumulatively, this helps protect habitat, wildlife, and human resources in the area, as well as downstream areas throughout the State.

Stormwater Impacts

The City of Mankato is located adjacent to the Minnesota River in Blue Earth County and can be divided into three main topographical regions. These regions are the flood plain of the Minnesota River, the steep bluff area, and the upland plain. The flood plain of the Minnesota River is the area where much of the original development of Mankato occurred. Most of the bluff area which can be developed has been developed. The vast majority of this steep bluff area will remain as open area. The upland plain is the area where much of the present development is occurring, including the AUAR area. The City experienced rapid growth in the 1970s and 1980s as a result of the expansion of the state university facilities and because the City of Mankato has become a commercial hub for the south and south-central region of Minnesota. In the upper plain above the Minnesota River bluff where the AUAR area is located, the land is extremely flat and the natural drainage pattern in some locations is difficult to determine. The drainage patterns within the AUAR area and outside the AUAR area drain into the Minnesota River via small tributary waterways.

Minnesota's lakes, rivers, wetlands and streams all depend on the replenishing waters of annual precipitation. However, when rain falls on land and impervious areas such as paved streets, parking lots and building rooftops it can wash away soil and sediment. Stormwater runoff from these surfaces can change both water quality and quantity affecting our water resources physically, chemically and biologically. The stormwater from within and outside the Project area will increase potentially having a negative effect on downstream waters. An increase in runoff also has the potential to overwhelm existing water systems including ravines, creeks, and rivers, possibly leading to the destruction of habitat, erosion problems, downstream sediment deposits, and or an increase in nutrient levels.

The natural drainage patterns within the City of Mankato have already been disturbed by existing development. Existing storm drains, streets, road ditches, culverts, and other forms of urban development have made some diversions and concentrations of stormwater runoff. While most of this development has not had a serious adverse effect on the natural drainage pattern, the intensive development along the Minnesota River has created serious construction problems and increased the cost in providing adequate outlets for the major systems outside the AUAR area.

The City of Mankato has been very proactive in order to address cumulative impacts

associated with stormwater and is currently in the process of updating its existing Stormwater Master Plan to include the mandated MS4 standards. The requirements of the Phase II MS4 program include: 1) Reduce the discharge of pollutants to the “maximum extent practicable”, 2) Protect water quality; and 3) Satisfy the appropriate water quality requirements of the Clean Water Act. Minnesota regulates the disposal of stormwater through a combined NPDES/SPS permit and through the Municipal Separate Storm Sewer Systems (MS4s) program for applicable projects.

Mandated by Congress under the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Stormwater Program is a comprehensive national program for addressing polluted stormwater runoff. Minnesota regulates the disposal of stormwater through State Disposal System (SDS) permits. The MPCA issues combined NPDES/SDS permits for construction sites, industrial facilities and municipal separate storm sewer systems (MS4s).

As stated earlier, the Minnesota Pollution Control Agency (MPCA) is in charge of reducing the pollution and damage caused by stormwater runoff. This designation was mandated by Congress under the Clean Water Act because of the pollution and damage caused by stormwater runoff. In 1990, the EPA promulgated rules establishing Phase I of the NPDES stormwater program. This program included regulations for MS4s to implement a stormwater management program to control polluted discharges. The Phase II rule extends coverage of this program to smaller municipalities and businesses and includes the City of Mankato.

Stormwater and drainage plans for cumulative impacts and master planning have been prepared for the City since the 1970s. According to the Drainage Study prepared by Barr Engineering (1994) one concern in the preparation of all stormwater systems is to protect and preserve the existing ravines and creek valleys located within the City. Many alternatives are considered to provide protection to these ravines. One method provides storage in the upland areas in order to decrease flowrates, in other areas, diversions are made from one drainage area to another to decrease flowrates into the ravines, and a third method collects the stormwater from numerous small systems and outlets it at a single location where it is more economically feasible to provide the energy dissipation necessary to protect the ravines and creek valleys.

In addition, the City of Mankato has a Strategic Plan which is updated biannually and is used for planning and lays the framework for future development while identifying cumulative impacts. Overall, the City of Mankato is committed to seeking ways to improve and better manage stormwater runoff in an effort to improve the quality of water going into the Minnesota River and to reduce negative cumulative impacts associated with runoff. To do this, the City closely monitors stormwater facilities to ensure they meet acceptable water quality standards. The City also has a strategy to keep citizens educated and informed about water quality issues, among numerous other planning and design activities to ensure the quality of water going into the River.

As stated earlier, a cumulative approach for stormwater impacts utilizing a stormwater system and stormwater basins on-site will allow the majority of the stormwater runoff from this development to be treated. This treatment will remove sediment from the stormwater, enhance the quality of runoff off-site and outside the AUAR boundary, and will provide open space area for wildlife species. Regional stormwater ponds will also be utilized for further treatment to remove sediment. In addition, Barr Engineering is currently in cooperation with the City and is studying stormwater treatment for purposes of designing another large regional stormwater treatment basin in order to treat stormwater before entering the Minnesota River. Utilizing numerous treatment facilities helps prevent negative cumulative effects to the local population, the Minnesota River, local and regional habitat and wildlife, and downstream amenities.

30. Other potential environmental impacts.

If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

Other potential environmental impacts. *If applicable, this item should be answered as requested by the EAW form.*

This Project is not believed to cause any anticipated adverse environmental impacts not addressed in this AUAR.

31. Summary of issues.

Do not complete this section if the EAW is being done for EIS scoping; instead, address relevant issues in the draft Scoping Decision document, which must accompany the EAW. List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

Summary of Issues. *The RGU may answer this question as asked by the form, or instead may choose to provide an Executive Summary to the document that basically covers the same information. Either way, the major emphasis should be on: potentially significant impacts, the differences in impacts between major development scenarios, and the proposed mitigation.*

Before the City of Mankato can issue the necessary permits for development within the Project, the City chose to order a substitute form of environmental review, this AUAR, for the Northeast Industrial Service. As a result, future projects in the AUAR study area may not require environmental review if they are consistent with the original assumptions made in this review, if their impacts do not exceed those anticipated by the AUAR, and the mitigation measures are implemented as required for an AUAR.

This Project encompasses approximately 750 acres and is anticipated to have approximately 4,467,257 gross sq ft of floor space.

A summary of issues has been included as part of the Draft Mitigation Plan. The major emphasis in this summary and mitigation plan is on the potentially significant impacts and the differences in impacts between the major development scenarios. The summary of issues and the proposed mitigation can be found in the Draft Mitigation Plan below.

RGU CERTIFICATION. The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.

Certification by the RGU. *In an AUAR document, no certifications as listed at the end of the EAW form are necessary. (The RGU is legally responsible for the accuracy and completeness of the document and for properly distributing it nonetheless.)*

Mitigation Plan. *The final AUAR document must include an explicit mitigation plan. At the RGU's option, a draft plan may be included in the draft AUAR document; of course, whether or not there is a separate item for a draft mitigation plan, proposed mitigation must be addressed through the document.*

It must be understood that the mitigation plan in the final document takes on the nature of a commitment by the RGU to prevent potentially significant impacts from occurring from specific projects. It is more than just a list of ways to reduce impacts—it must include information about how the mitigation will be applied and assurance that it will. Otherwise, the AUAR may not be adequate and/or specific projects may lose their exemption from the individual review.

The RGU's final action on the AUAR must specifically adopt the mitigation plan; therefore, the plan has a "political" as well as a technical dimension.

Response to comments on the draft AUAR document. *The final AUAR document must include a section specifically responding to each timely and substantive comment on the draft that indicates the way in which the comment has been addressed. Similar comments may be combined for purposes of responding.*

MITIGATION PLAN & IMPLEMENTATION

Mitigation Plan. *The final AUAR document must include an explicit mitigation plan. At the RGU's option, a draft plan may be included in the draft AUAR document; of course, whether or not there is a separate item for a draft mitigation plan, proposed mitigation must be addressed through the document.*

It must be understood that the mitigation plan in the final document takes on the nature of a commitment by the RGU to prevent potentially significant impacts from occurring from specific projects. It is more than just a list of ways to reduce impacts—it must include information about how the mitigation will be applied and assurance that it will. Otherwise, the AUAR may not be adequate and/or specific projects may lose their exemption from the individual review.

The RGU's final action on the AUAR must specifically adopt the mitigation plan; therefore, the plan has a "political" as well as a technical dimension.

This Draft Mitigation Plan is submitted as part of the AUAR process to provide reviewers, regulators, and prospective tenants or purchasers of land with an understanding of the actions necessary to protect the environment and limit impacts by the proposed project.

The primary mechanism for mitigation of environmental impacts is the effective use of existing codes, rules, and regulations. The enforcement options available and the general mitigation measures include:

- Execution of a developer(s) agreement(s) under the City of Mankato's ordinance.
- Approval of a development that includes specific requirements including performance standards, design guidelines and phasing.
- Enforcement of the permitting requirements of all applicable local, state and federal agencies
- Requirement that a performance bond be submitted

The following section outlines the proposed draft mitigation measures for the anticipated environmental impacts as a result of the continued development and redevelopment of the Project.

I. Mitigation Areas

A. Cover type

- 1) Development may convert woodland (in sub-section G & H), upland (all sub-sections), and/or wetland areas to urban use.

- a) Possibly redefine setback distances for wetland areas and sensitive features.

The City will ask our citizen environmental committee to take this topic under consideration and provide us with a wetland buffer recommendation and plan based on your comments. However, please be aware that the majority of the project area is currently being utilized for agricultural crop production. The Wetland Conservation Act provides incentive to restoring wetlands impacted by agricultural activities and the City will continue to encourage this activity.

- b) Guidelines currently exist for wetland mitigation according to the WCA and Section 404 of the Clean Water Act. The Project will comply with these guidelines.

Currently, the City does not have mitigation or preservation efforts for woodland or native upland area. The City does have a ravine protection plan and the citizen environmental committee has woodland protection plans under consideration. The City will ask the citizen environmental committee to consider native prairie preservation plans and provide recommendations.

- c) Provide educational materials for re-vegetation areas in order to promote native plantings.
- 2) Development may impact the use of the area as a migratory and wildlife corridor.
 - a) Promote the preservation and maintenance of the majority of existing habitat areas.
 - b) Use conservation easements over natural areas and open space as an incentive for property owners in order to preserve woodland, wetland, and open space while ensuring area is available as a wildlife corridor.
- 3) Invasive species are present in MnDOT conservation areas.
 - a) Research the possibility of using existing wetland areas for wetland mitigation area if needed by improving the condition of existing wetland by removing invasive and exotic species to help restore the native plant communities and to help control invasives from entering other potential mitigation areas.

B. Sensitive resources

- 1) Wetlands *(The exact location of wetlands have not been determined, however, development may impact existing wetland areas)*
 - a) Wetland investigations are required to be performed according to the Corps of Engineers Wetland Delineation Manual. All wetland investigations are required to be submitted to the city for approval. All wetland approvals and permits are required to be obtained before preliminary plat.
 - b) Wetlands found on the site through the investigation will be handled in accordance to the 1991 Minnesota Wetland Conservation Act (WCA) and the Clean Water Act Section 404 administered by the Army Corps of Engineers.
 - c) Require sequencing standards of the Wetland Conservation Act (WCA) if development activities may impact a wetland.
 - d) Applicable wetland permits are required to be submitted and approved to obtain authorization for wetland alterations under WCA and Section 404 prior to project construction if development activities will impact a jurisdictional wetlands.
 - e) Wetland impacts which require mitigation will be in accordance with the requirements of the Wetland Conservation Act.
 - f) Permit applications and mitigation plans, as needed, will be required to be submitted to the Minnesota Department of Natural Resources, Minnesota Board of Water and Soil Resources, Blue Earth County Soil and Water Conservation District, and the City of Mankato.
 - g) The City is aware that in order for the AUAR to remain valid as a substitute form of review, the environmental analysis document and the plan for mitigation must be revised if five years have passed since the City adopted the original environmental analysis document and plan for mitigation. Since the projected timeline for the extension of CSAH 12 is greater than 5 years and is only in the conceptual stage of planning, the City is aware this AUAR document will most likely need to be updated.

C. Water Supply

- 1) The Project will require the abandonment of private water wells.
 - a) All existing wells located on the site or identified (including any unregistered wells encountered during construction), will be sealed and abandoned in compliance with MDH regulations prior to site development.
 - b) The Project will not involve the installation of private water wells.

- 2) Development at the site will utilize the City of Mankato's public water supply.
 - a) Provide City water supply services to the Project area to limit private wells in the area.
- 3) The Project will require an estimated increased water supply of 61.622 MGY and 0.785 MGD peak demand by year 2009.
 - a) The City currently has enough permitted appropriation volume to accommodate a full build-out of the Project. However, based on the future anticipated growth of the Mankato area, it is likely the City will need to amend their DNR permit to provide for anticipated growth of the Mankato area in addition to the Project, prior to the year 2025, or before the Project area is fully developed.

D. Erosion & Sedimentation

- 1) The increase in impervious surfaces and construction activities will lead to erosion and sedimentation issues.
 - a) Effective erosion and sediment control using MPCA Best Management Practices (BMPs) is required for all land disturbances to control water runoff and sediment erosion on adjacent properties, streets, storm drains, pond areas, or other water courses.
 - b) Apply to the MPCA for a NPDES permit prior to development and construction activities. Follow the MPCA Best Management Practices during development
 - c) Enforce the erosion and sediment control regulations.
 - d) Develop a stormwater management plan for development that addresses storage and treatment needs associated with the increase in volume and rate of runoff.
 - e) Require the construction of a temporary sediment basin to control runoff from construction activities.
 - f) Updated the City of Mankato's Stormwater Master Plan to include MPCA MS4 guidelines.
 - g) Provide stormwater systems within the Project area.

E. Surface Water Runoff

- 1) The increase in impervious surfaces in the Project area will increase the need for stormwater control design measures.
 - a) Update City of Mankato's Stormwater Master Plan to include MPCA MS4 Standards.
 - b) Include designs in the stormwater plan as required by MPCA MS4 Standards.
 - c) Regional and site specific stormwater ponds will be constructed to treat quantity and quality of runoff from the Project site.
 - d) Hydrologic data regarding the existing site drainage will be modeled through a computer modeling system such as HydroCAD by Applied Microsystems.

F. Wastewater

- 1) Wastewater will be generated in the Project Area.
 - a) No on-site municipal or industrial wastewater treatment is planned for the Project. All sanitary wastewater from the Project will be treated at the Mankato Wastewater Treatment Plant. No improvements are necessary to increase capacity to service this Project.
 - b) Provide sanitary sewer systems in the Project area to mitigate potential contamination from septic systems.

- c) Amend the city's Sanitary Sewer System Master Plan and Capital Improvements Plan to include the needs of the Project.
- d) Construct the major infrastructure improvements needed to expand the capacity of the wastewater system.

G. Traffic

- 1) Traffic generated from development in the Project area will have an impact to the existing transportation system.
 - a) Road updates will be required to CSAH 3 to include a 4-land road. The extension of existing roads will also be needed, including Sohler Drive and Technology Drive.
 - b) CSAH 12 will be extended through the Project area intersecting with US 14 and continuing south. As part of the CSAH 12 extension project a new interchange at US 14 will be constructed.
 - c) Interior roads will be designed for the Project area.
- 2) Increase traffic volumes will impact existing intersections.
 - a) An interchange for CSAH 12 and US-14 will be required to mitigate for traffic impacts.
 - b) DM&E railroad crossings in the Project Area will need to be analyzed and possibly re-designed for traffic increases.
 - c) Road construction in the Project area may allow Sakatah Trail to be re-aligned to provide for better access.
 - d) The City of Mankato, Blue Earth County, and the Minnesota Department of Transportation will work together to preserve right-of-way in and limit access to the CSAH 3, CSAH 12, and TH 22 corridors.

H. Nearby Resource

- 1) Possible Historic Properties (possible locations in Subsection F & G).
 - a) Obtain information on the listed properties from the database search.
 - b) Determine if the properties listed have historical significance.
- 2) Parks & Trail
 - a) The City of Mankato's Park & Open Space Master Plan calls for a future community park.
 - i. Part of the Project area will be utilizing and set aside for a regional community park (possibly in Subsection C or D).
 - ii. During stormwater planning, all opportunities to provide stormwater facilities along park corridors will be identified.
 - b) Sakatah Trail has access problems adjacent to the Project area.
 - i. The Sakatah Trail has the potential to be re-routed to help the access problems in the area. The City will reserve land within the Project area for recreational and open space opportunities (possibly sub-section C or D).
 - ii. The City of Mankato and Blue Earth County will look collaboratively into the possible relocation of the Trail to provide better access and to utilize natural areas within the Project boundary prior to development.

EXHIBITS

Exhibits:

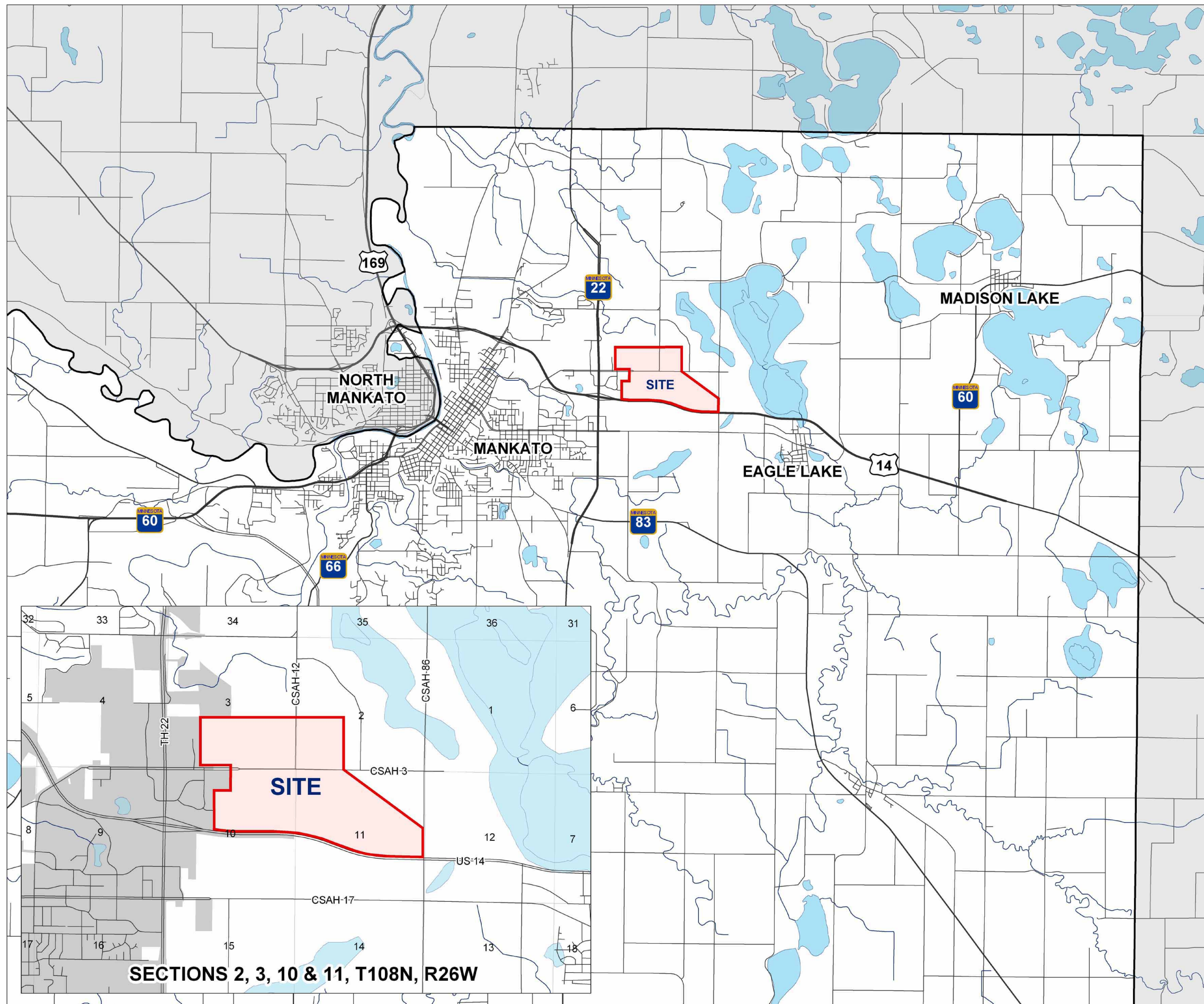
- A. County Location Map
- B. USGS Topographical Map
- C. AUAR Boundary Map
- D. Existing Land Use Plan
- E₁. Future Landuse Map Scenario A.
- E₂. Future Landuse Map Scenario B.
- F. Current Zoning Map
- G. Cover Type Map
- H. Soil Type Map
- I. Hydric Soils & NWI Map
- J. Prime Farmland Map
- K. Watershed Areas Map
- L. Transportation Plan
- M. Sanitary Sewer System Plan
- N. Stormwater Management Plan
- O. Water Supply System Plan
- P. Private (Dry) Utilities Plan

COUNTY LOCATION MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

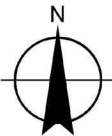


I&S Engineers & Architects, Inc.
One firm - start to finish

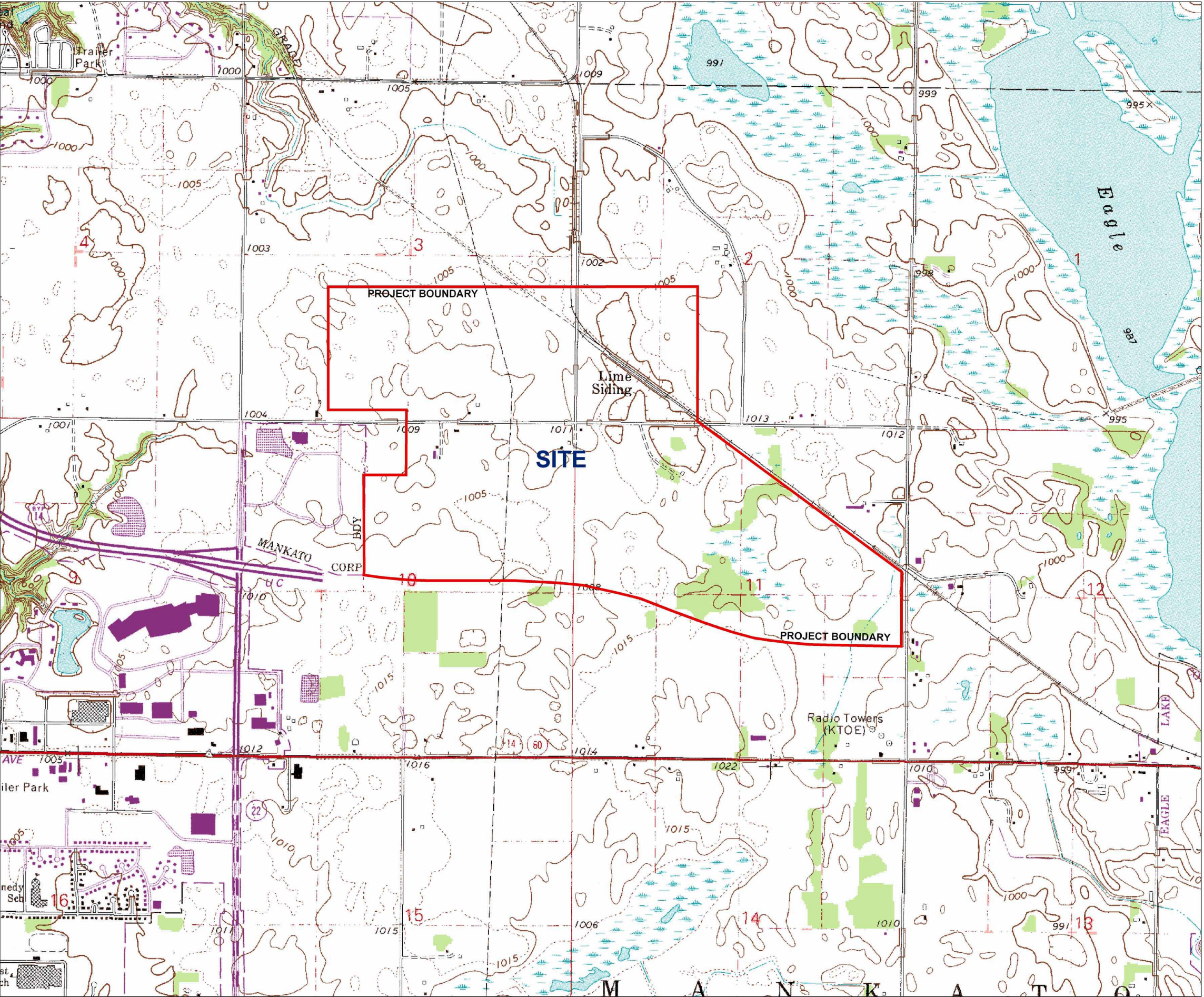


USGS TOPOGRAPHY MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



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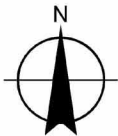
Source:
Mankato East Quadrangle

AUAR AREA BOUNDARY MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

LEGEND

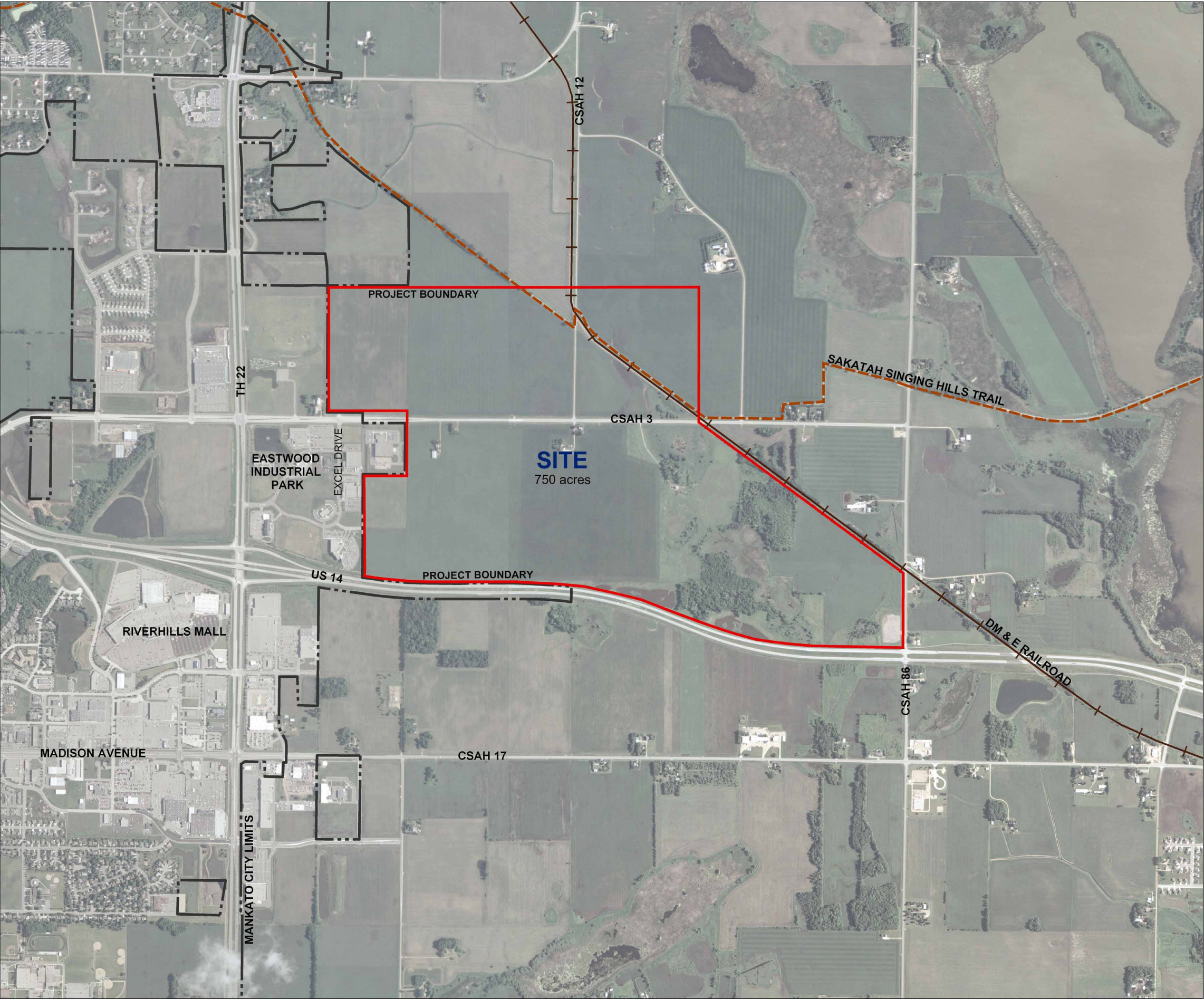
- Sakatah Singing Hills Trail
- Mankato City Limits
- +— Railroad



0 500 1,000 2,000 3,000 Feet



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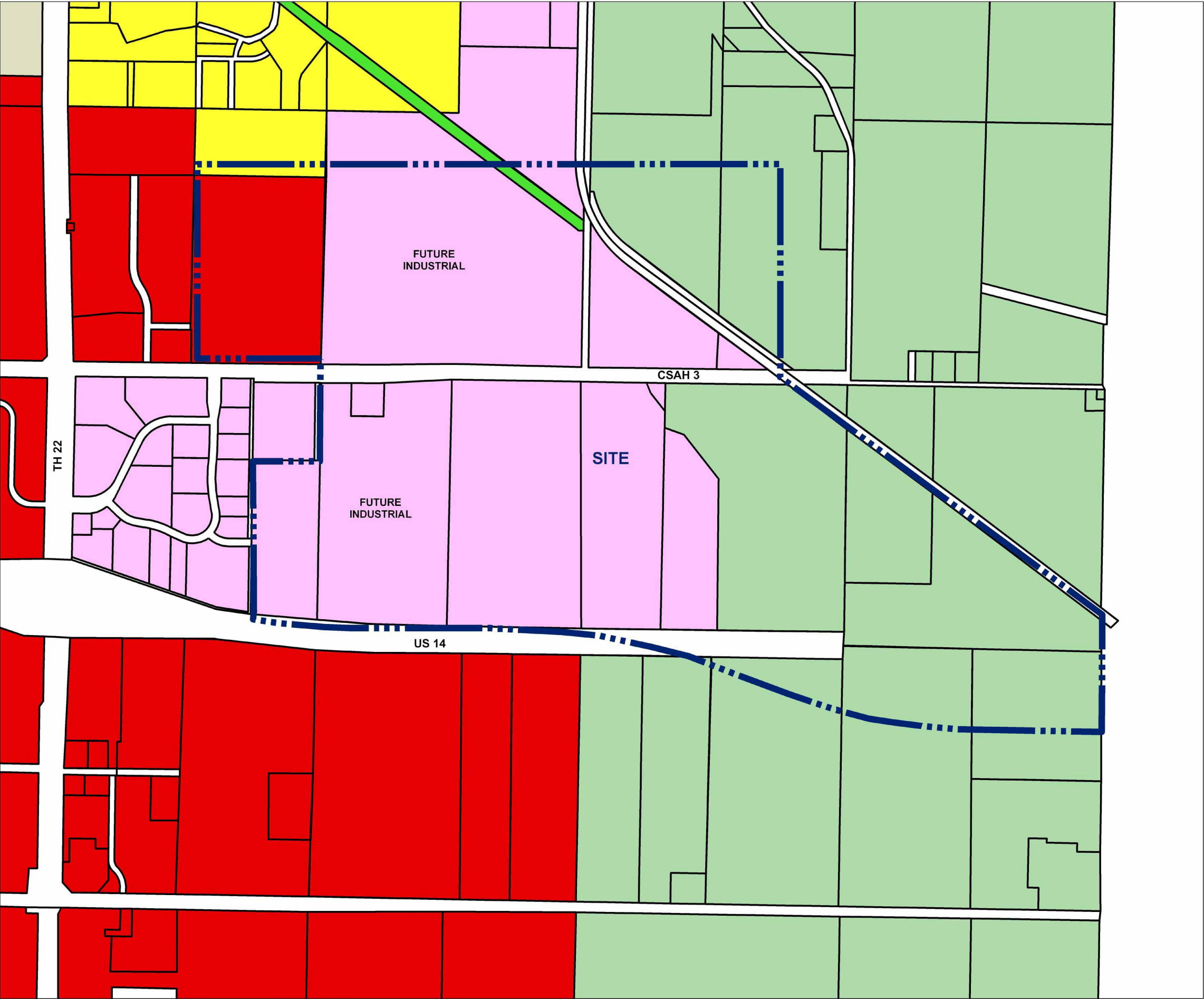


Source:
2003 FSA Orthophotograph

EXISTING LAND USE PLAN

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

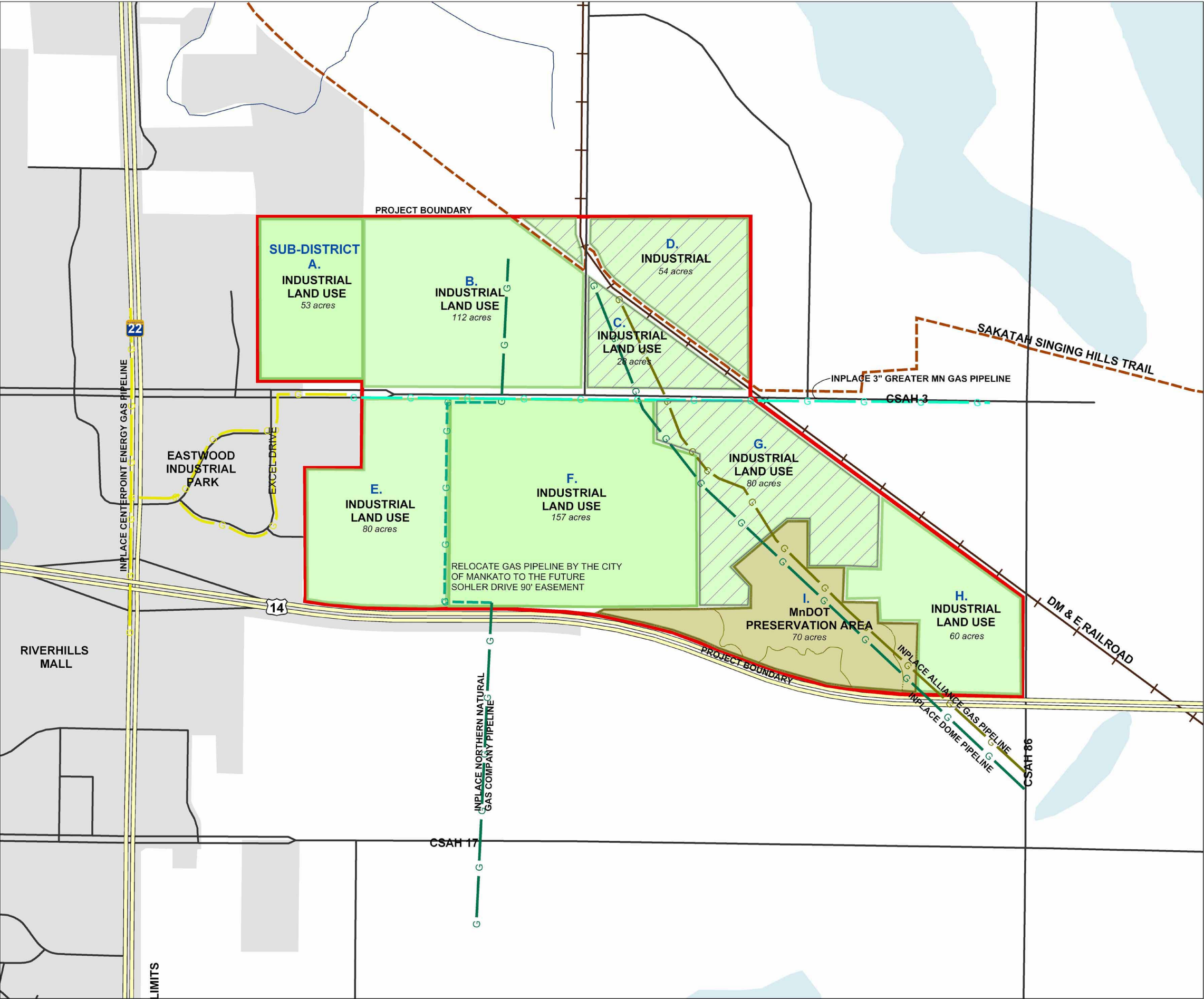
LEGEND	
 Agriculture	 Office Residential
 Commercial	 Park, Recreation, Open Space
 Light Industry	 Public & Semi Public
 Low Density Residential	 Medium Density Residential



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AUAR FUTURE LAND USE
SCENARIO A.

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



LEGEND

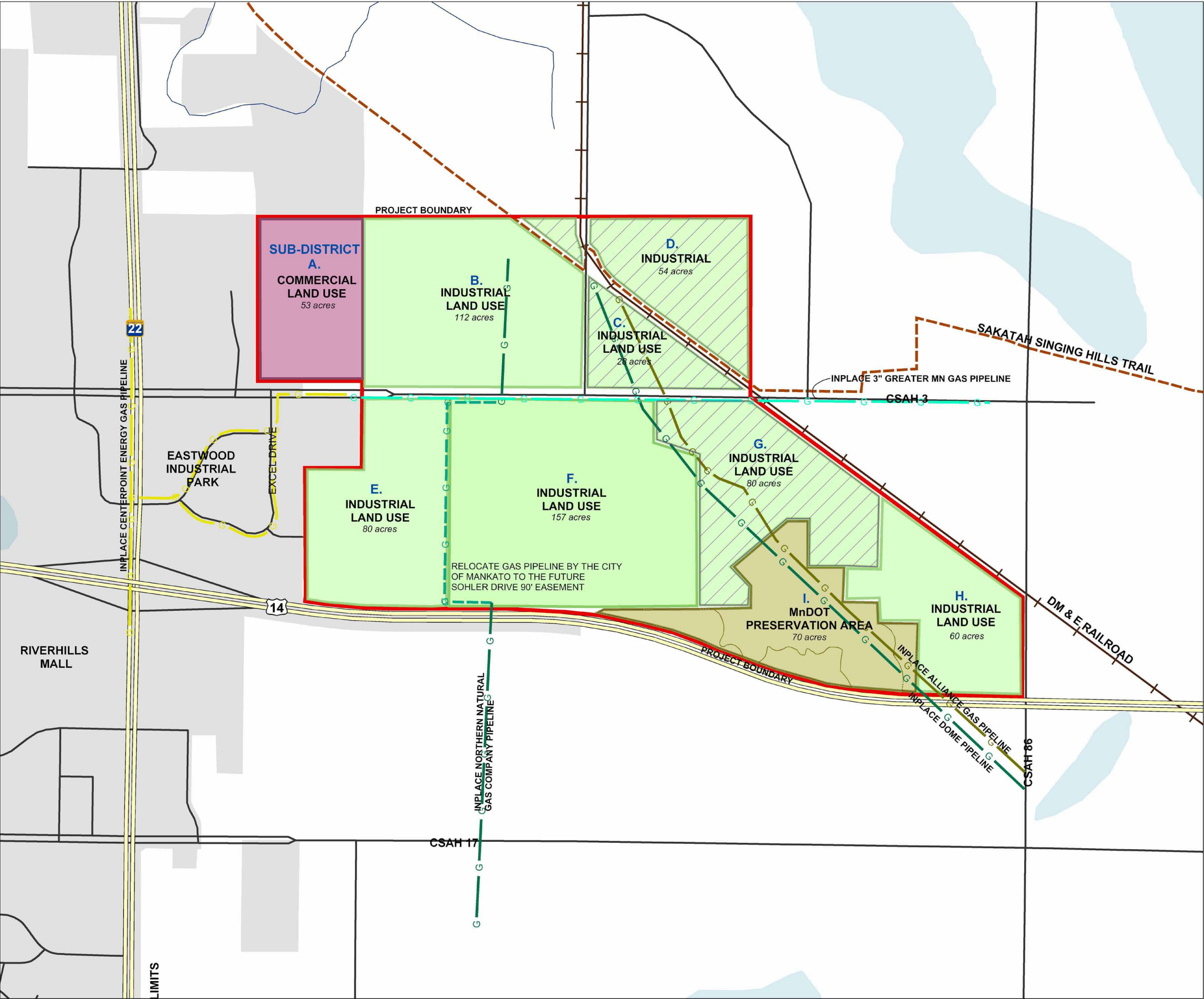
- Sakatah Singing Hills Trail
- Project Boundary
- City of Mankato
- Railroad
- Industrial Land Use
- Commercial Land Use
- MnDOT Preservation Area
- Potential Sensitive Resource Area



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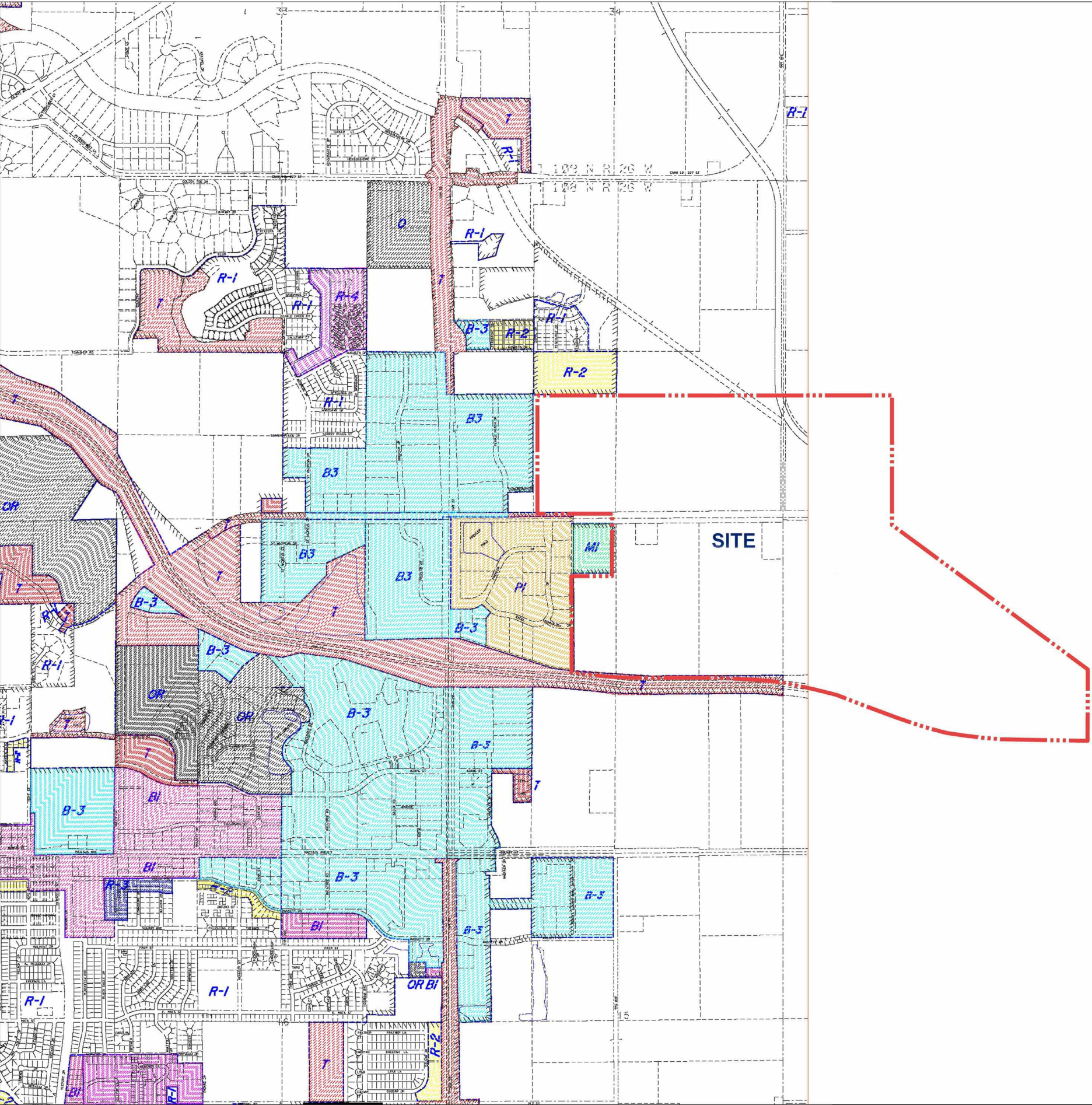
AUAR FUTURE LAND USE SCENARIO B.

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



MANKATO ZONING MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

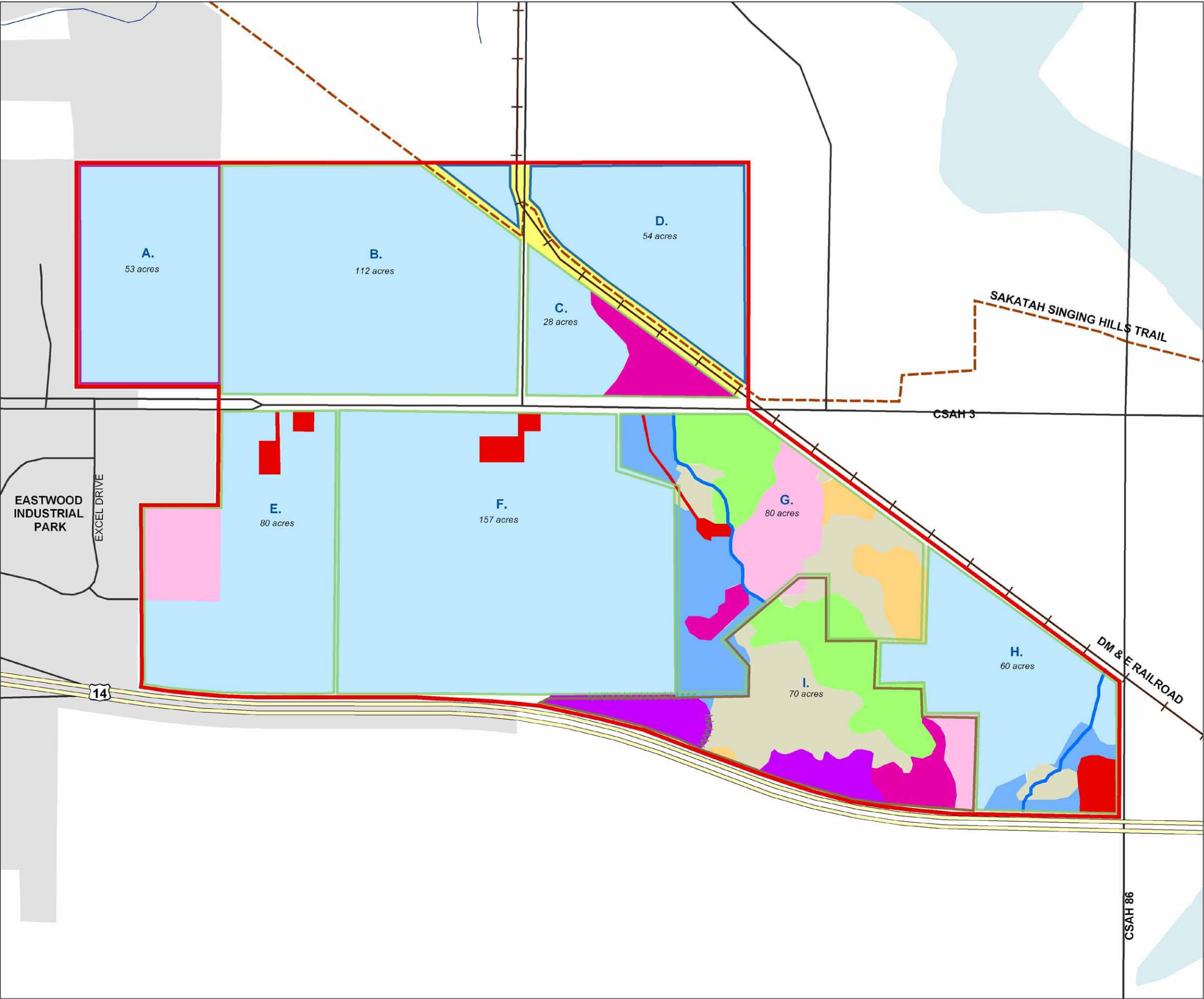


LEGEND	
■ T Transition District	■ B-1 Community Business District
■ R-1 One-Family Dwelling	■ B-3 Highway Business District
■ R-2 One & Two Family Dwelling	■ PI Planned Industrial
■ R-4 Multiple Dwelling	■ M-1 Light Industrial
■ OR Office Residential	■ M-2 Heavy Industrial



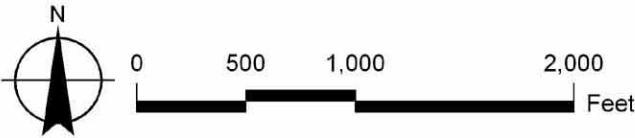
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COVER TYPE MAP
NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



LEGEND

- City of Mankato
- Sakatah Singing Hills Trail
- Railroad
- Land Use Scenarios**
 - Commercial/Industrial Land Use
 - Industrial Land Use
 - MnDOT Preservation Area
 - Open Space
- Cover Types**
 - Agricultural
 - Residential & Impervious Surfaces
 - Mesic & Dry Introduced Short Grass & Legumes
 - State Trail & Railroad
 - Mesic Scrub/Shrubland
 - Emergent Wetland with Scattered Shrubs/Scrubs
 - Mixed Mesic Deciduous Woodland
 - Emergent & Scrub/Shrub Wetland
 - Saturated & Mesic Grassland & Wetland
 - Excavated Wetland
 - Stream Beds
 - Tree Rows



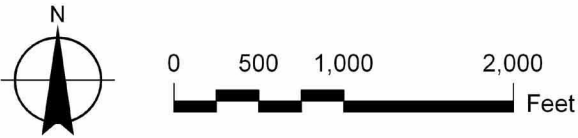
SOIL SURVEY MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

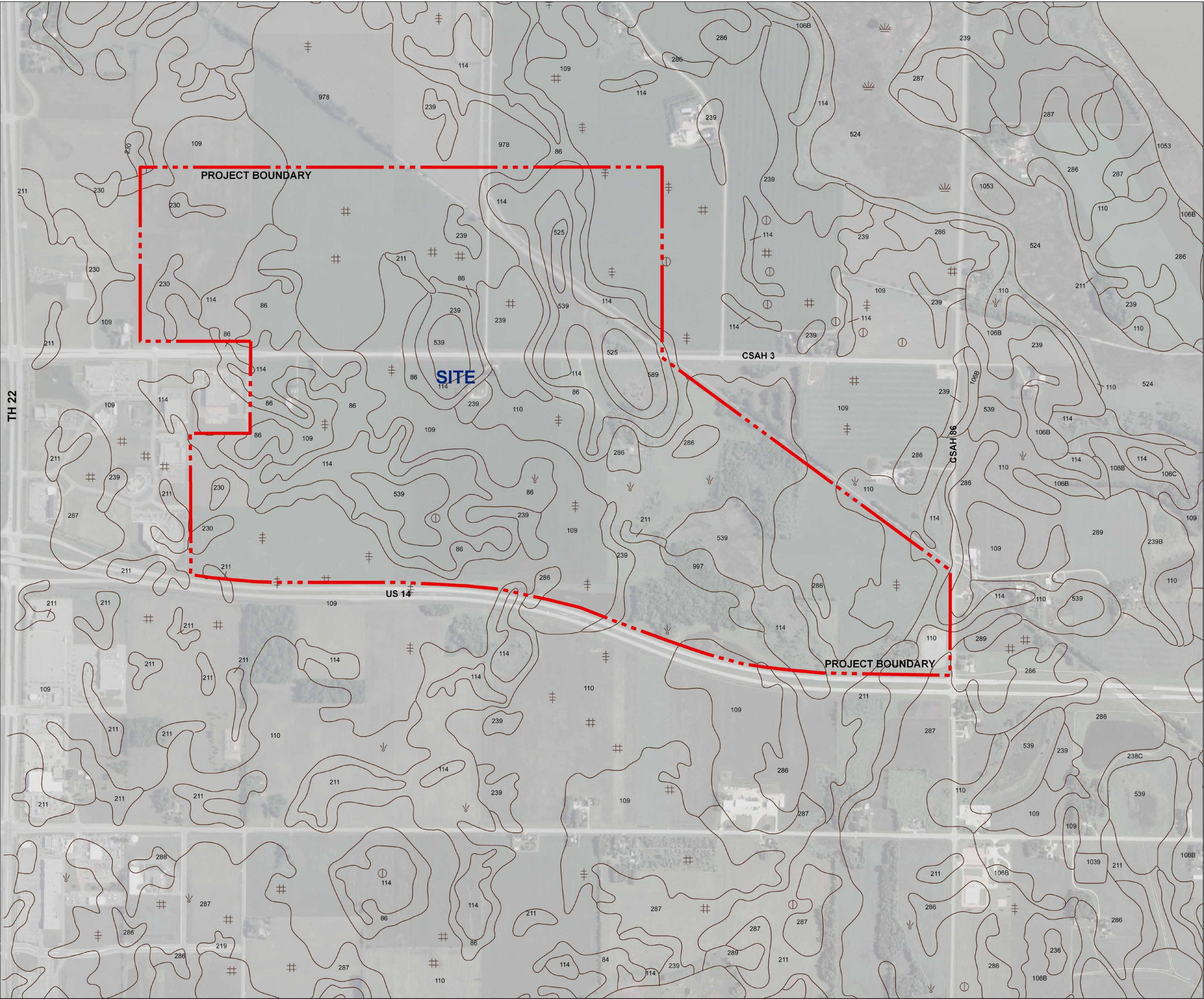
LEGEND

Soil Types
86: Canisteo Silty Clay Loam
109: Cordova Clay Loam
110: Marna Silty Clay Loam
114: Glencoe Silty Clay Loam
211: Lura Silty Clay
230: Guckeen Silty Clay Loam, 1-4% slopes
239: Le Sueur Clay Loam, 1-3 % Slope
286: Shorewood Silty Clay Loam, 1-6% slope
525: Muskego Muck
539: Palms Muck
997: Marna-Barbert complex

Map Symbols
Marsh or Swamp
High lime soil 2 acres or less
Better drained soil 2 acres or less
Wet Spot



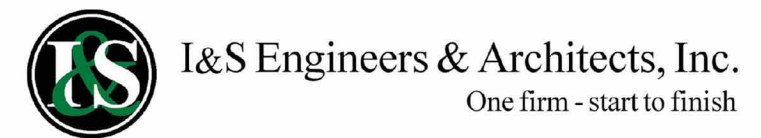
I&S Engineers & Architects, Inc.
One firm - start to finish



Source:
Blue Earth County Soil Survey, 1978

HYDRIC SOILS & NWI MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



Source:
Blue Earth County Soil Survey, 1978

PRIME FARMLAND MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

LEGEND

Soil Types

86: Canisteo Silty Clay Loam

109: Cordova Clay Loam

110: Marna Silty Clay Loam

114: Glencoe Silty Clay Loam

211: Lura Silty Clay

230: Guckeen Silty Clay Loam, 1-4% slopes

239: Le Sueur Clay Loam, 1-3 % Slope

286: Shorewood Silty Clay Loam, 1-6% slope

525: Muskego Muck

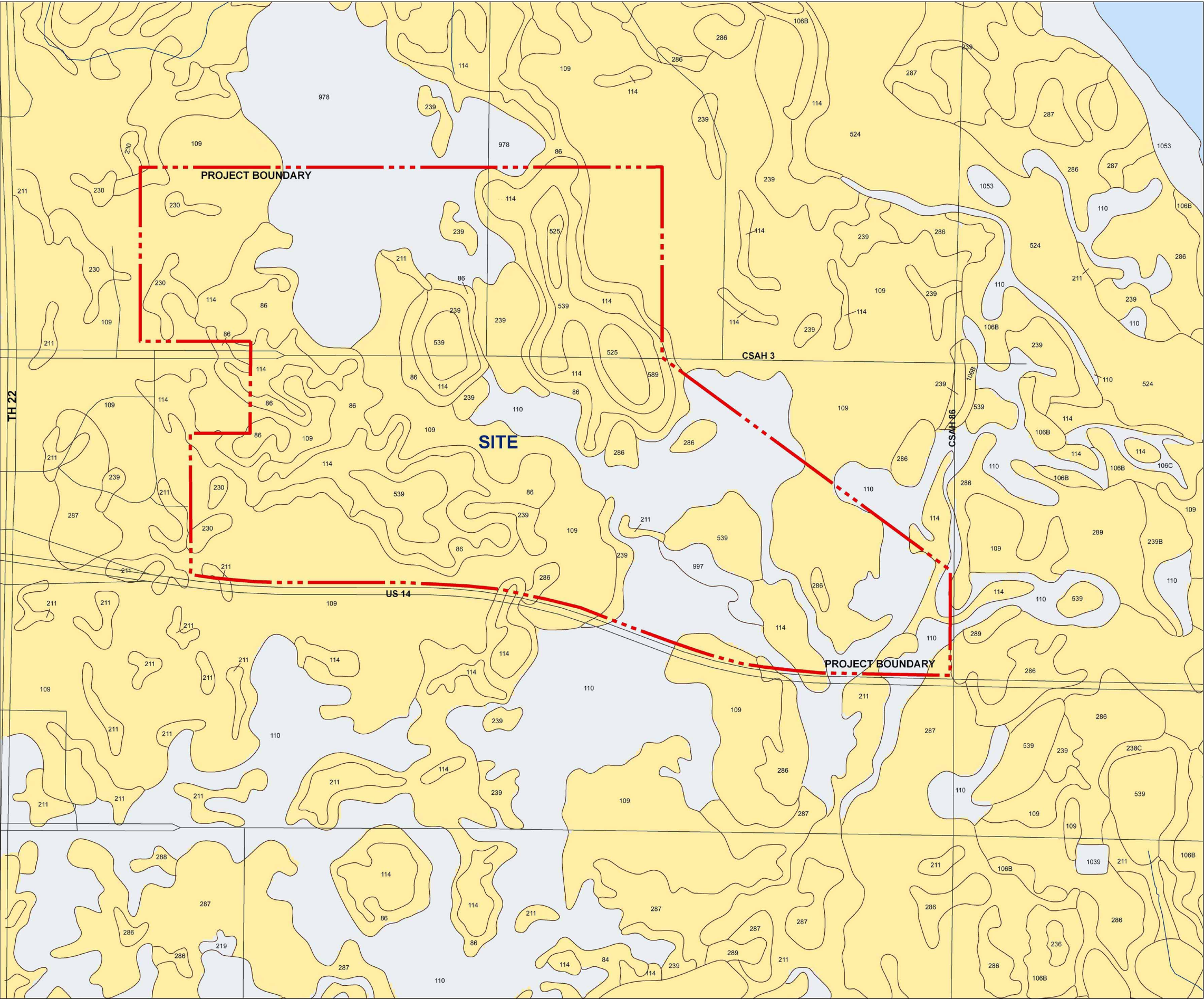
539: Palms Muck

997: Marna-Barbert complex

Prime Farmland

Non-Prime Farmland

Lake



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One firm - start to finish

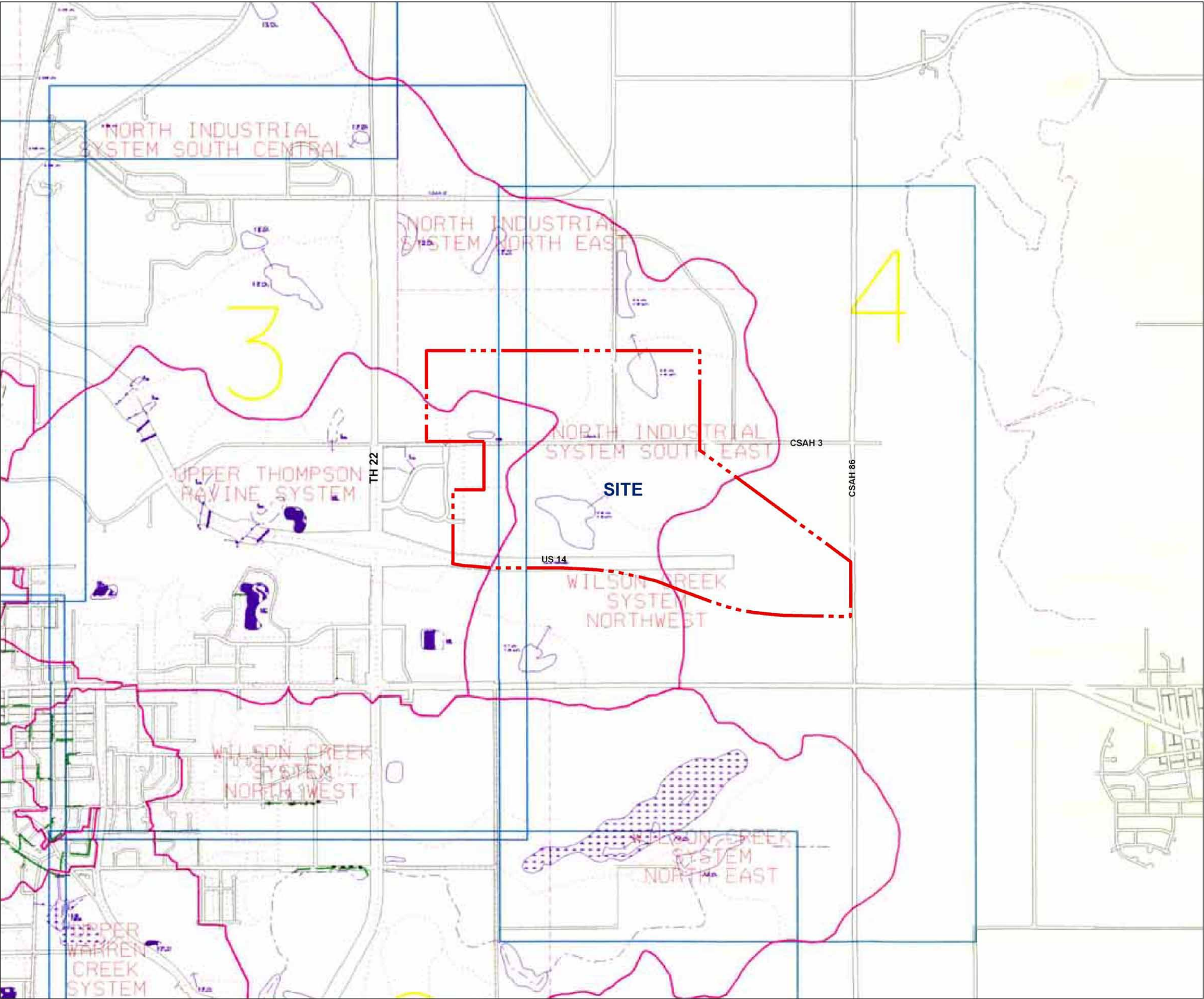
Source:
Blue Earth County Soil Survey, 1978

WATERSHED AREAS MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

LEGEND

- Stormwater District Lines
- Regional Stormwater Facilities



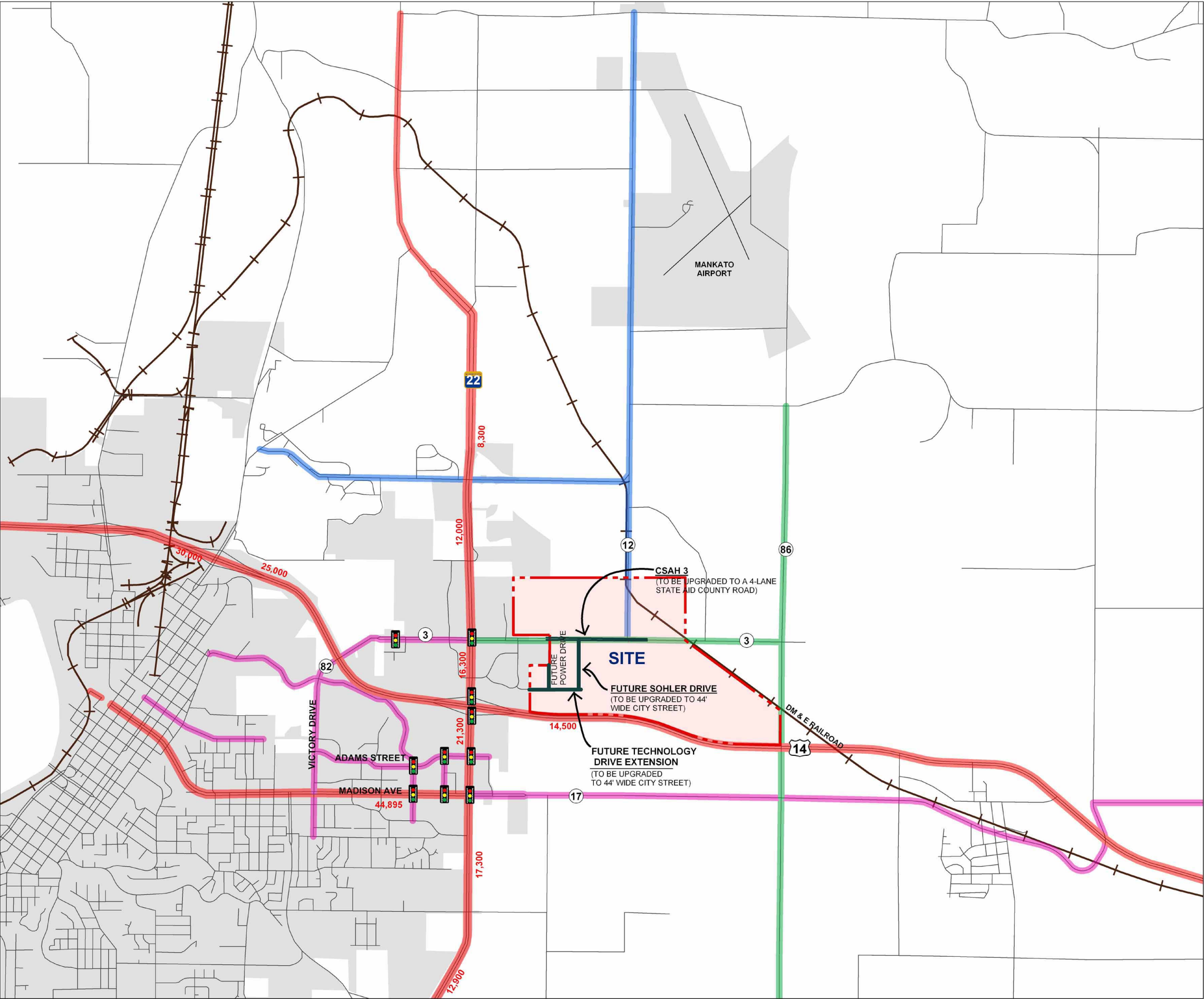
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Feet



I&S Engineers & Architects, Inc.
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TRANSPORTATION PLAN

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



LEGEND

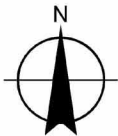
Existing Traffic Volumes

Roadways not analyzed

- Less than 500
- 500-1,999
- 2,000-4,999
- 5,000-10,000
- Greater than 10,000

— Rail Road

NUMBERS INDICATE AVERAGE ANNUAL DAILY TRAFFIC VOLUMES



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One firm - start to finish

Source:
MATAPS 2003, Existing Traffic Volumes, Figure 5
MnDOT Trunk Highway Volumes, 2004

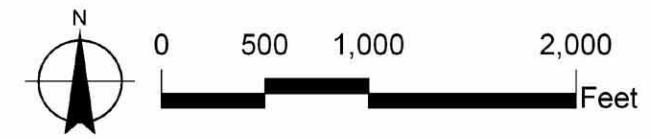
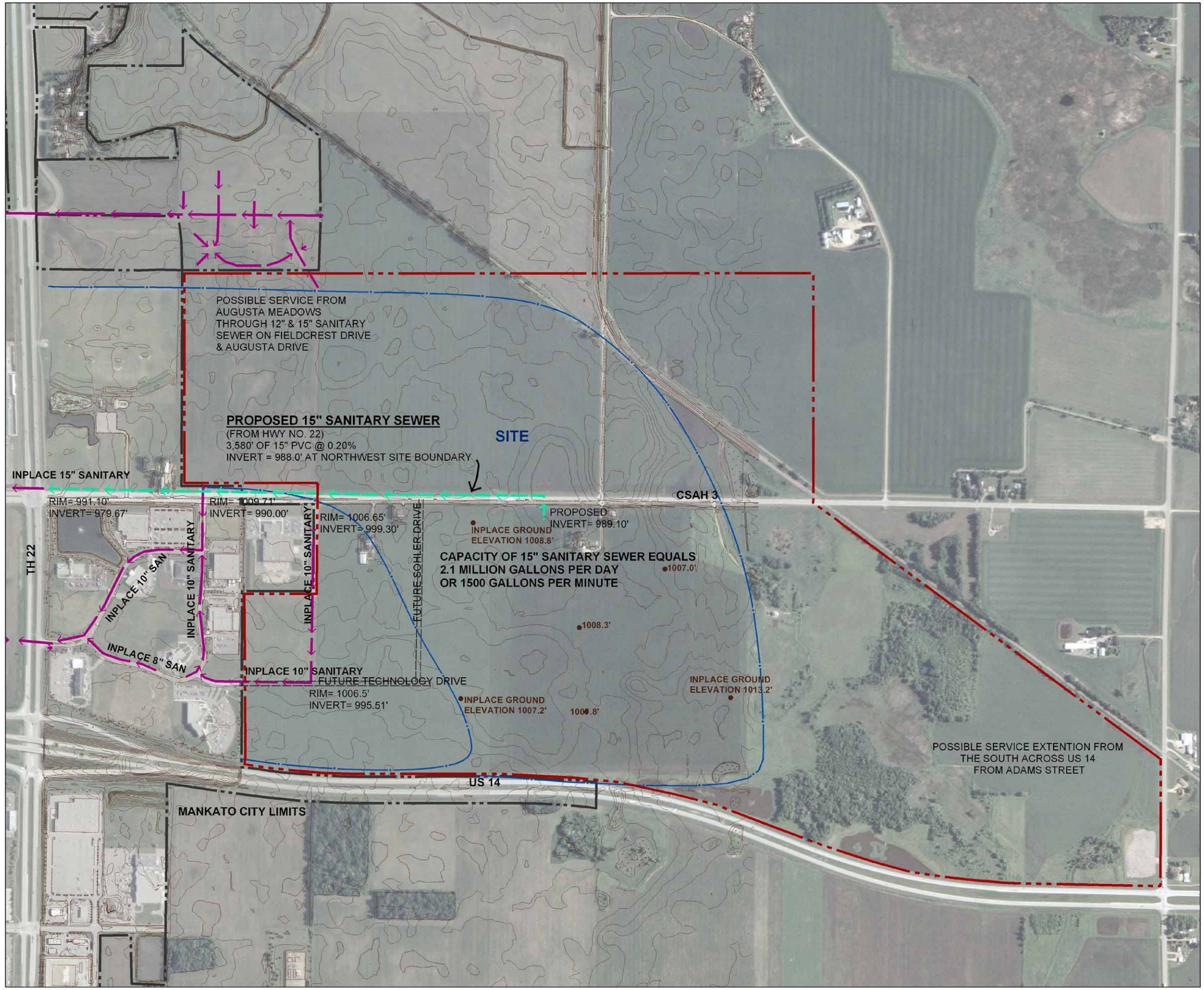
EXHIBIT M.


SANITARY SEWER SYSTEM PLAN

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

LEGEND

- Mankato City Limits
- ← Inplace Sanitary Lines
- Proposed Sanitary Sewer
- Sanitary Sewer Service Boundary



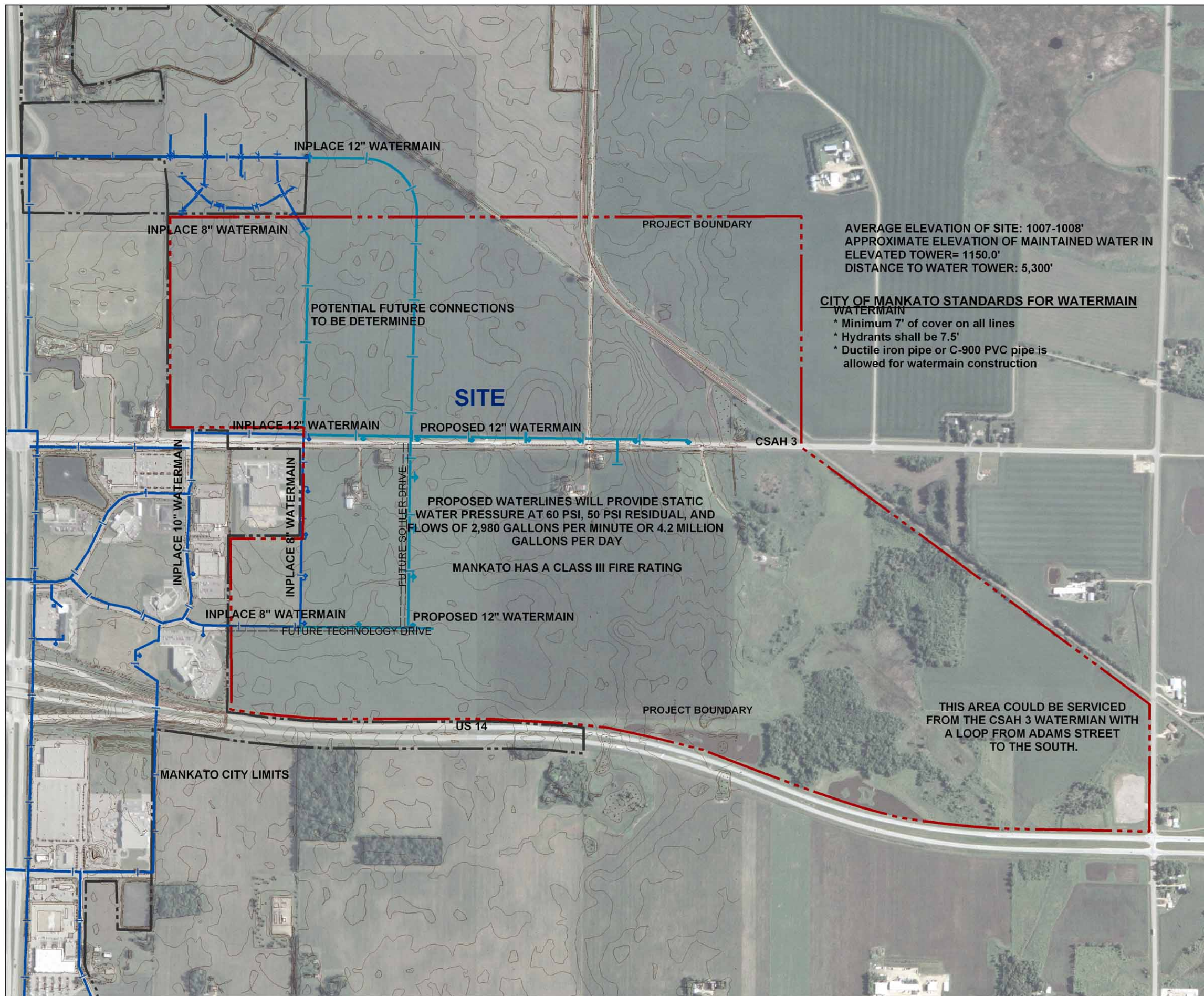
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Source:
1998 Mankato 2' Contours Flight Data
2003 FSA Orthophotograph

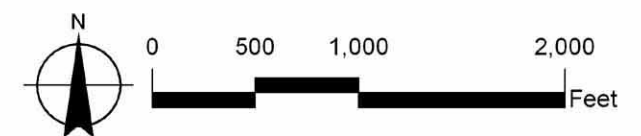
EXHIBIT O.

WATER SUPPLY SYSTEM PLAN

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

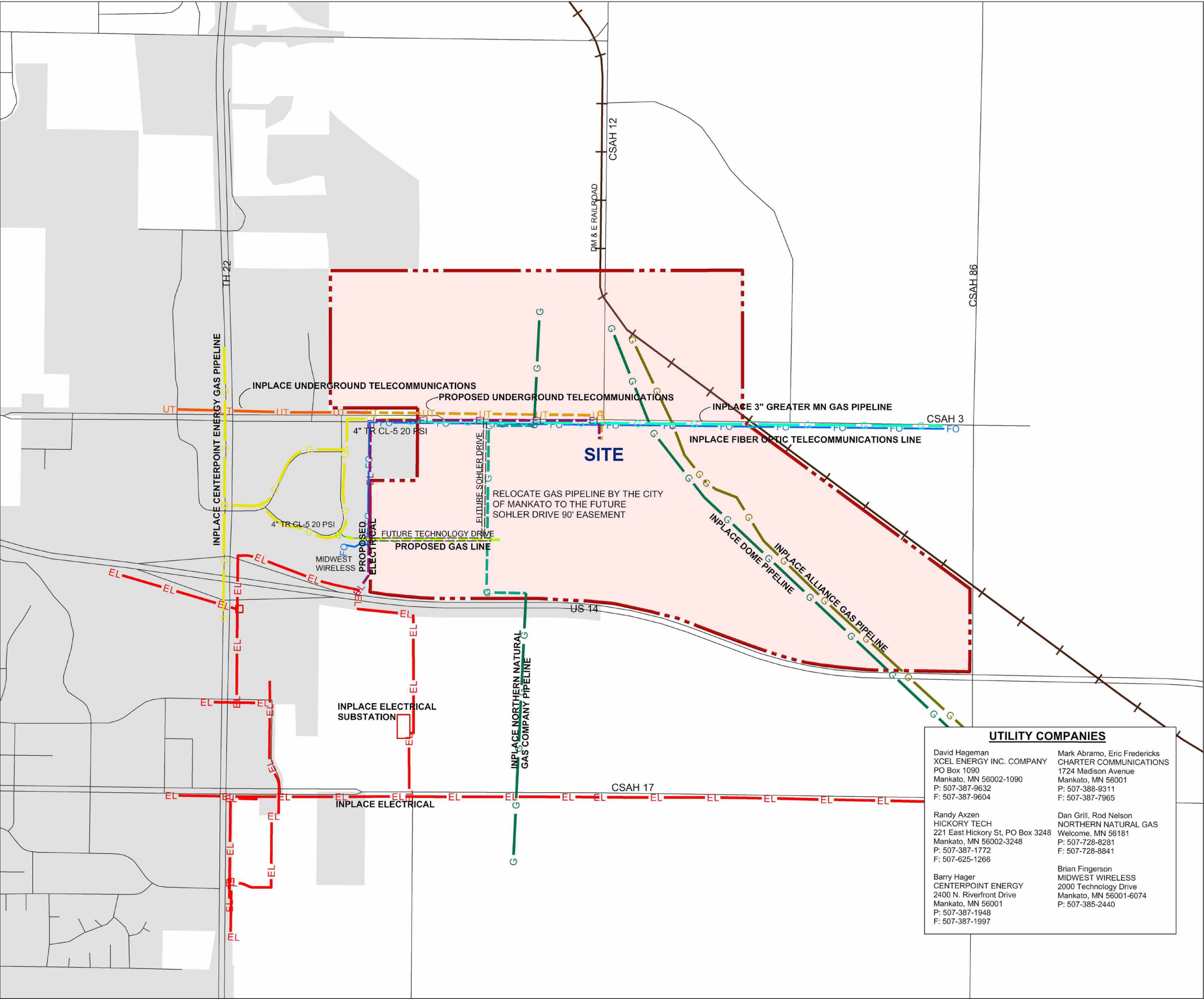


LEGEND	
-----	Mankato City Limits
—	Inplace Watermain
—	Proposed Watermain
◆	Inplace Water Hydrants
◆	Proposed Water Hydrants



PRIVATE (DRY) UTILITIES PLAN

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



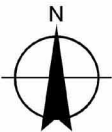
LEGEND

- Inplace Gas Line (Greater MN Gas)
- Inplace Gas Line (Alliance)
- Inplace Gas Line (Northern Natural)
- Inplace Gas Line (CenterPoint)
- Inplace Underground Telecommunications
- Inplace Electrical
- Inplace Fiber Optics Telecommunications
- Proposed Gas Line
- Proposed Underground Telecommunications
- Proposed Electrical
- Relocated Gas Pipeline



UTILITY COMPANIES

David Hageman XCEL ENERGY INC. COMPANY PO Box 1090 Mankato, MN 56002-1090 P: 507-387-9632 F: 507-387-9604	Mark Abramo, Eric Fredericks CHARTER COMMUNICATIONS 1724 Madison Avenue Mankato, MN 56001 P: 507-388-9311 F: 507-387-7965
Randy Axzen HICKORY TECH 221 East Hickory St, PO Box 3248 Mankato, MN 56002-3248 P: 507-387-1772 F: 507-625-1266	Dan Grill, Rod Nelson NORTHERN NATURAL GAS Welcome, MN 56181 P: 507-728-8281 F: 507-728-8841
Barry Hager CENTERPOINT ENERGY 2400 N. Riverfront Drive Mankato, MN 56001 P: 507-387-1948 F: 507-387-1997	Brian Fingerson MIDWEST WIRELESS 2000 Technology Drive Mankato, MN 56001-6074 P: 507-385-2440



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APPENDICES

Appendices:

- A. Resolution to initiate the AUAR process
- B. MN Department of Natural Resources (DNR) Correspondence
- C. State Historical Preservation Office (SHPO) Correspondence
- D. MN Department of Health (DOH) Correspondence
- E. Transportation, Air & Noise Analysis by SRF Consulting, Inc.
- F. Natural Resources Assessment Inventory
- G. Comments Received During 30-day Comment Period
- H. Response to Comments

APPENDIX A.
Resolution to initiate the AUAR process

A RESOLUTION OF THE CITY COUNCIL
ORDERING THE PREPARATION OF AN ALTERNATIVE URBAN AREA WIDE
ASSESSMENT UNDER MINNESOTA RULES 4410.3610

WHEREAS, the City of Mankato anticipates the development of land within a future growth area;

WHEREAS, the future growth area is referred to as the Northeast Industrial Service Area (NEISA), and said area is depicted in Exhibit A; and

WHEREAS, the City has a Comprehensive Plan that includes the NEISA and the Comprehensive Plan contains the following:

A. A land use plan designating the existing and proposed location, intensity, and extent of use of land and water for residential, commercial, industrial, agricultural, and other public and private purposes.

B. A public facilities plan describing the character, location, timing, sequence, function, use, and capacity of existing and future public facilities of the local governmental unit. The public facilities plan must include at least the following parts:

(1) a transportation plan describing, designating, and scheduling the location, extent, function, and capacity of existing and proposed local public and private transportation facilities and services; and

(2) a sewage collection system policy plan describing, designating, and scheduling the areas to be served by the public system, the existing and planned capacities of the public system, and the standards and conditions under which the installation of private sewage treatment systems will be permitted.

C. An implementation program describing public programs, fiscal devices, and other actions to be undertaken to implement the comprehensive plan. The implementation plan must include a description of official controls addressing the matters of zoning, subdivision, and private sewage treatment systems, a schedule for the implementation of those controls, and a capital improvements program for public facilities.

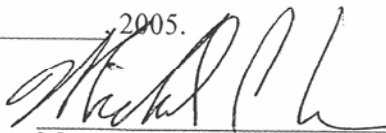
WHEREAS, Exhibit A also depicts the boundaries of the proposed area for which an Alternative Urban Areawide Assessment is proposed in order to determine the impacts of proposed development and the mitigation of impacts; and

WHEREAS, Exhibits B and C depict anticipated development scenarios in the assessment area and Exhibit B is consistent with the adopted Land Use Plan; and

NOW, THEREFORE, BE IT RESOLVED by the Mankato City Council, that an Alternative Urban Areawide Review under Minnesota Rules 4410.3610 be undertaken for the area depicted within the boundary depicted on Exhibit A.

This resolution shall become effective immediately upon its passage and without publication.

Passed this 9 day of May, 2005.



Mayor

Attest: Renae Kopischke
City Clerk

COUNTY LOCATION MAP

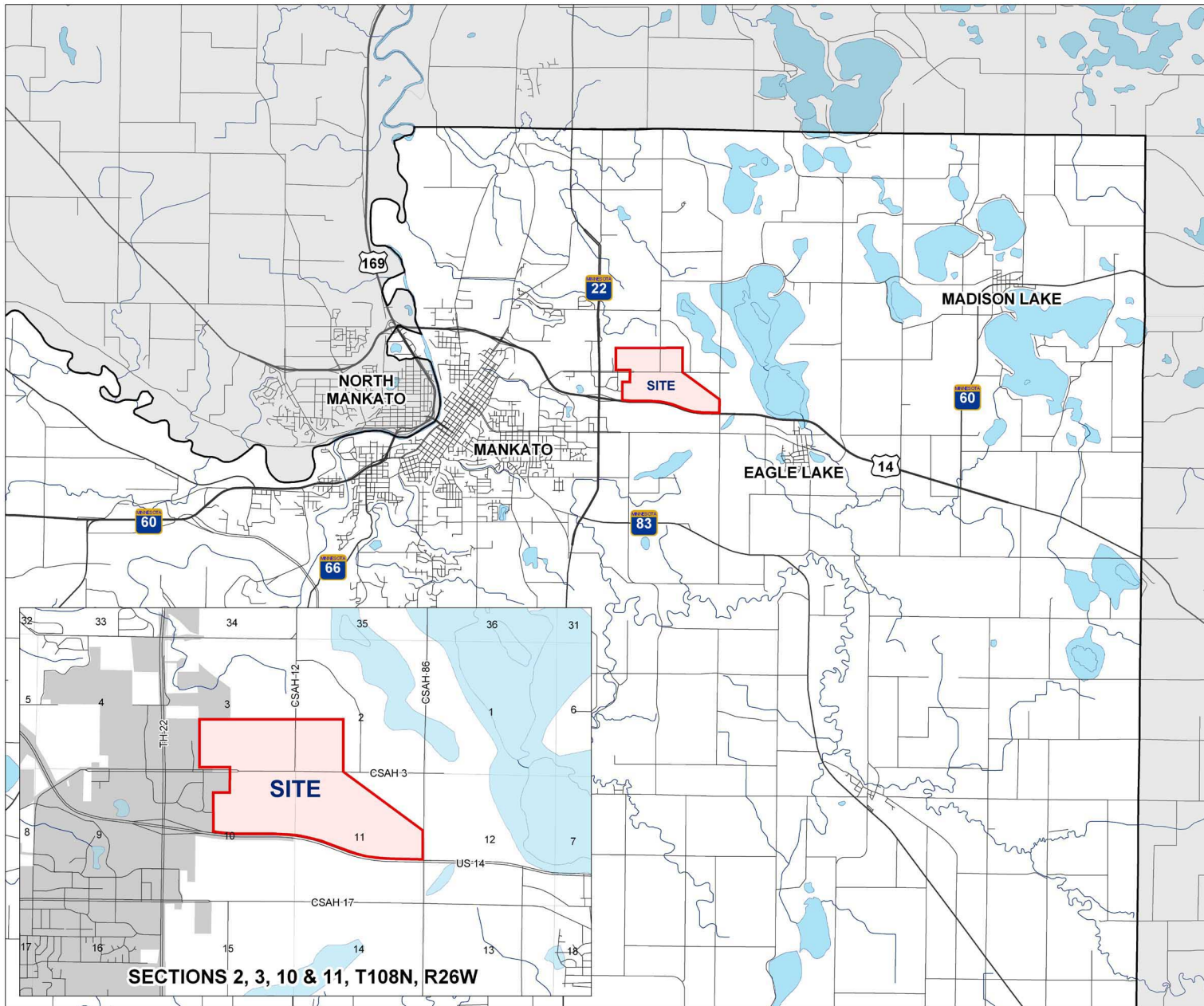
NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

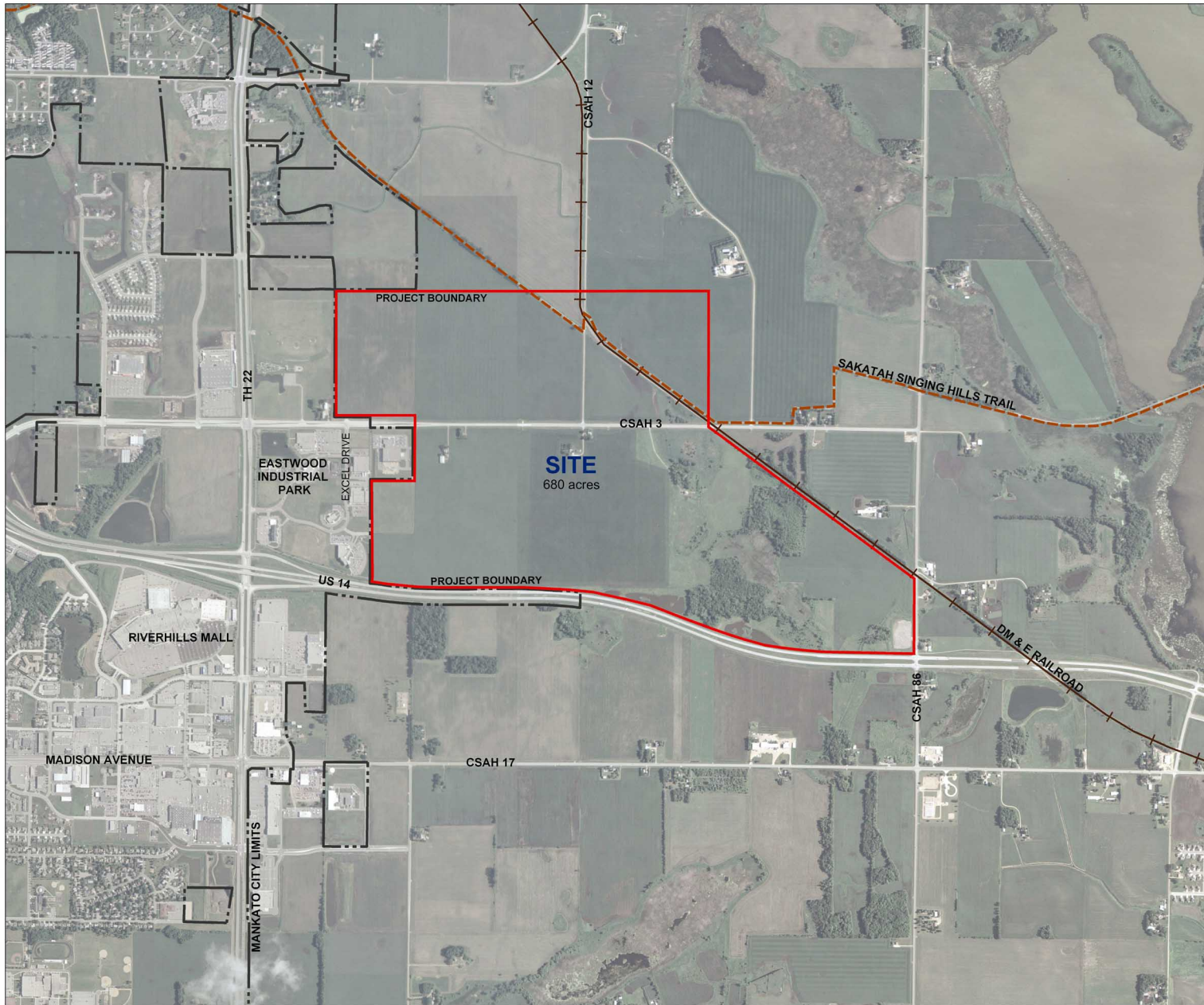


0 0.5 1 2 3
Miles



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AUAR AREA BOUNDARY MAP

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

LEGEND

- Sakatah Singing Hills Trail
- Mankato City Limits
- +— Railroad



0 500 1,000 2,000 3,000
Feet



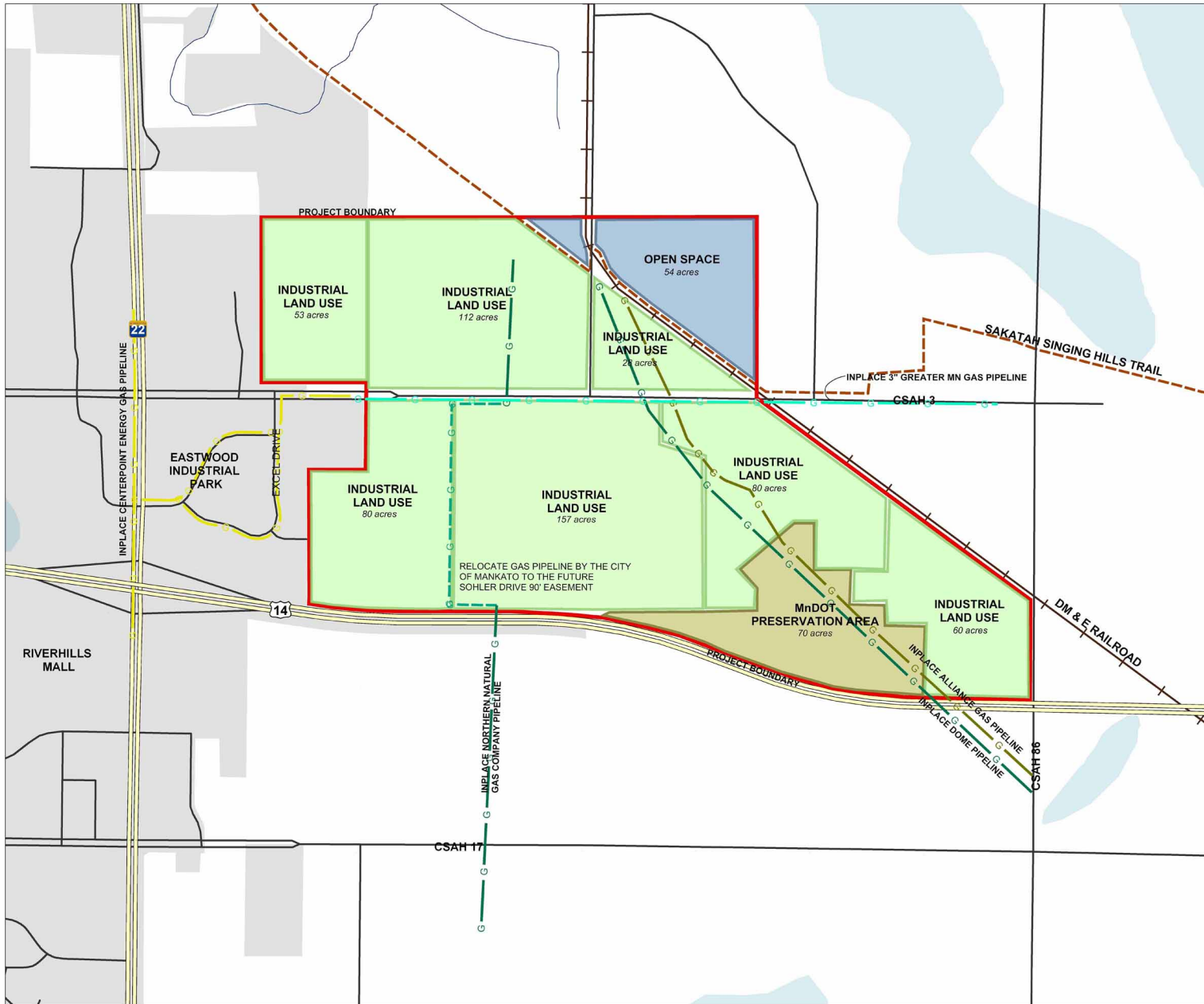
I&S Engineers & Architects, Inc.
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AUAR FUTURE LAND USE SCENARIO A.

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA



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AUAR FUTURE LAND USE SCENARIO B.

NORTHEAST INDUSTRIAL SERVICE AREA
MANKATO, MINNESOTA

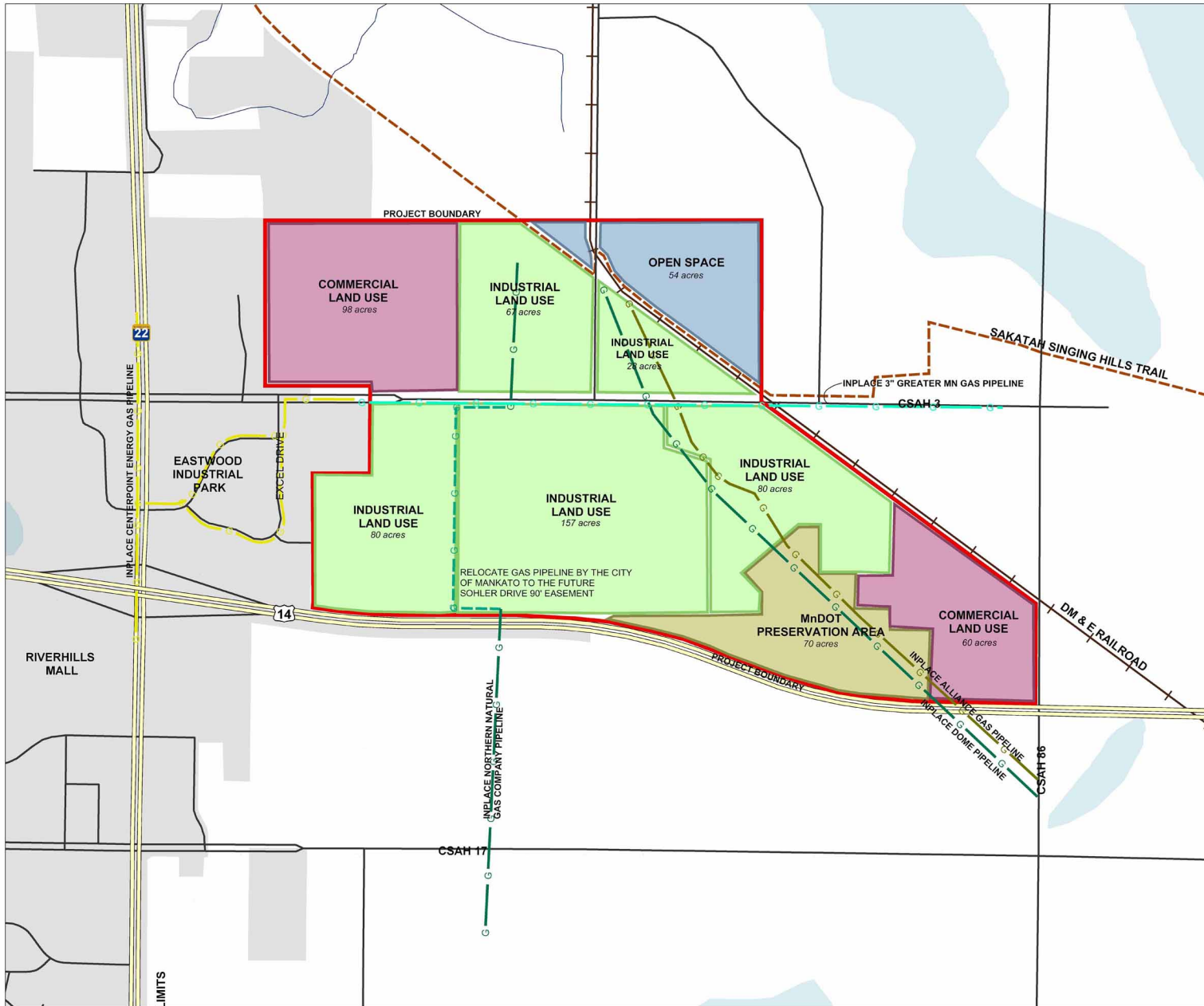
LEGEND	
	Project Boundary
	City of Mankato
	Sakatah Singing Hills Trail
	Railroad
	Commercial Land Use
	Industrial Land Use
	MnDOT Preservation Area
	Open Space



0 500 1,000 2,000
Feet



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APPENDIX B.
MN Department of Natural Resources (DNR) Correspondence



Minnesota Department of Natural Resources

Natural Heritage and Nongame Research Program, Box 25
500 Lafayette Road

St. Paul, Minnesota 55155-40__

Phone: (651) 296-7863 Fax: (651) 296-1811 E-mail: sarah.hoffmann@dnr.state.mn.us

April 15, 2005

Mr. Jamie Swenson
I&S Engineers & Architects, Inc.
1409 North Riverfront Drive
Mankato, MN 56001

Re: Request for Natural Heritage information for vicinity of proposed Northeast Industrial Service Area
AUAR, T108N R26W Sections 2 & 3, T108N R26W Sections 10 & 11, Blue Earth County
NHNRP Contact #: ERDB 200500731

Dear Mr. Swenson,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are no known occurrences of rare species or natural communities in the area searched.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Division of Ecological Services, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. Its purpose is to foster better understanding and protection of these features.

Because our information is not based on a comprehensive inventory, there may be rare or otherwise significant natural features in the state that are not represented in the database. A county-by-county survey of rare natural features is now underway, and has been completed for Blue Earth County. Our information about natural communities is, therefore, quite thorough for that county. However, because survey work for rare plants and animals is less exhaustive, and because there has not been an on-site survey of all areas of the county, ecologically significant features for which we have no records may exist on the project area.

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on *rare natural features*. It does not constitute review or approval by the Department of Natural Resources as a whole. If you require further information on the environmental review process for other natural resource-related issues, you may contact your Regional Environmental Assessment Ecologist, Mike North, at (218) 828-2433.

An invoice for the work completed will be mailed to you under separate cover within two weeks of the date of this letter. You are being billed for map and database search and staff scientist review. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

FOR

Sarah D. Hoffmann

Endangered Species Environmental Review Coordinator

DNR Information: 651-296-6157 • 1-888-646-6367 • TTY: 651-296-5484 • 1-800-657-3929

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APPENDIX C.
State Historical Preservation Office (SHPO) Correspondence

Jamie Swenson

From: Cinadr, Thomas [thomas.cinadr@mnhs.org]
Sent: Monday, March 28, 2005 10:30 AM
To: Jamie Swenson
Subject: RE: Database search: Archaeological & Architecture/History (Beadell Property)
Attachments: Historic.doc

No archaeological sites were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested. A report containing the historic properties identified is attached.

The result of this database search provides a listing of recorded archaeological sites and historic architectural properties that are included in the current SHPO databases. Because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development projects within that area. Additional research, including field survey, may be necessary to adequately assess the area's potential to contain historic properties.

With regard to Environmental Assessment Worksheets (EAW), a negative known site/structure response from the SHPO databases is not necessarily appropriate information on which to base a "No" response to EAW Question 25a. It is the Responsible Governmental Unit's (RGU) obligation to verify the accuracy of the information contained within the EAW. A "No" response to Question 25a without written justification should be carefully considered.

If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic architectural properties, you may need to hire a qualified archaeologist and/or historian. Please contact the SHPO by phone at 651-296-5462 or by email at mnshpo@mnhs.org for current lists of professional consultants in these fields.

Tom Cinadr

Survey and Information Management Coordinator
Minnesota State Historic Preservation Office
Minnesota Historical Society
345 Kellogg Blvd. West
St. Paul, MN 55102

651-205-4197 (voice)
651-282-2374 (fax)

-----Original Message-----

From: Jamie Swenson [mailto:jlswen@is-ea.com]
Sent: Friday, March 25, 2005 12:37 PM
To: Cinadr, Thomas
Subject: RE: Database search: Archaeological & Architecture/History (Beadell Property)

Tom,

We are completing an Alternative Urban Areawide Review (AUAR) for an area in Mankato, MN. The project is called 'Northeast Industrial Service Area'. As part of this, I need your assistance to complete a site search of the MN SHPO Archaeological Database and the MN SHPO Architecture/History Database for

information in the project area. The proposed development is in the following sections: NW 1/4 section 2, S 1/2 section 3, N 1/2 section 10, and section 11, all within Township 108N, Range 26W (Blue Earth County, Minnesota). The site is located just outside the Mankato city limits and is predominantly agricultural land. I have attached a map of the site in PDF format. Please let me know if you have any questions or if I can provide you with any more information to help complete this request.

Thank you for your assistance!

Sincerely,

Jamie Swenson
Natural Resources Management
I&S Engineers & Architects, Inc.

1409 N. Riverfront Drive
Mankato, MN 56001
p: 507-387-6651
f: 507-387-3583
c: 507-327-5418
email: jlswen@is-ea.com
web: www.is-ea.com

History/Architecture

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
COUNTY	Blue Earth										
CITY/TOWNSHIP:	Mankato Twp.										
Scheuer Farmstead	off Co. Hwy. 3	108	26	11	SW-NE-NW	Mankato East	BE-95-2H				BE-MKT-027
farmhouse		108	26	10	NE-NE-NE	Mankato East	BE-95-2H				BE-MKT-028
District School No. 55		108	26	11	NW-NW-N	Mankato East	BE-95-2H				BE-MKT-030

APPENDIX D.
MN Department of Health (DOH) Correspondence

Jamie Swenson

From: Terry Bovee [Terry.Bovee@state.mn.us]
Sent: Tuesday, May 10, 2005 12:50 PM
To: jlswen@is-ea.com
Cc: Bruce Olsen
Subject: Re: Requesting water supply information- Northeast IndustrialService Area AUAR

Jamie,

There are no Drinking Water Supply Mangement Areas in the proposed project area. The nearest public water supply well is located at Mankato Ford about one block east of the Hwy 22 and Hwy 14 intersection. Mankato Ford is a nontransient noncommunity type of public water supplier and as such will at some point be required to develop a wellhead protection plan.

Given current work loads, it may be a few years before the MDH would phase this water supplier into the wellhead protection program.

Please contact me if you have further questions.

Terry

Terry L. Bovee
MN. Dept. Of Health
Source Water Protection Unit
410 Jackson, Suite 500
Mankato, MN 56001
tel. 507-389-6597
fax 507-389-5563
terry.bovee@health.state.mn.us

>>> "Jamie Swenson" <jlswen@is-ea.com> 05/10/05 11:37 AM >>>
Terry,

We are doing Environmental Review for a project located east of Mankato in Mankato Township, Blue Earth County, MN. I am hoping you could tell me if there are any Drinking Water Supply Management Areas or public supply wells in proximity to the proposed project location (Sections 2, 3, 10, 11 T108N, R26W)? I have enclosed a map showing the location of the Project as a .pdf file.

If you have any questions, I can be reached by email or phone. Thanks for your help!

Jamie Swenson
Natural Resources Management
I&S Engineers & Architects, Inc.

1409 N. Riverfront Drive
Mankato, MN 56001
p: 507.387.6651
f: 507.387.3583
c: 507.327.5418
email: jlswen@is-ea.com
web: www.is-ea.com

25 NW 4th St, Suite 105
Faribault, Minnesota 55021
507.331.1500 Office

APPENDIX E.
Transportation, Air & Noise Analysis by SRF Consulting, Inc.



MEMORANDUM

TO: Doug Losee, REM, PLUS, I & S Engineers and Architects, Inc.

FROM: David Montebello, P.E., Principal
Mary Karlsson, Transportation Engineer

DATE: June 14, 2005

SUBJECT: Northeast Mankato Alternative Urban Areawide Review (AUAR)
Traffic Study

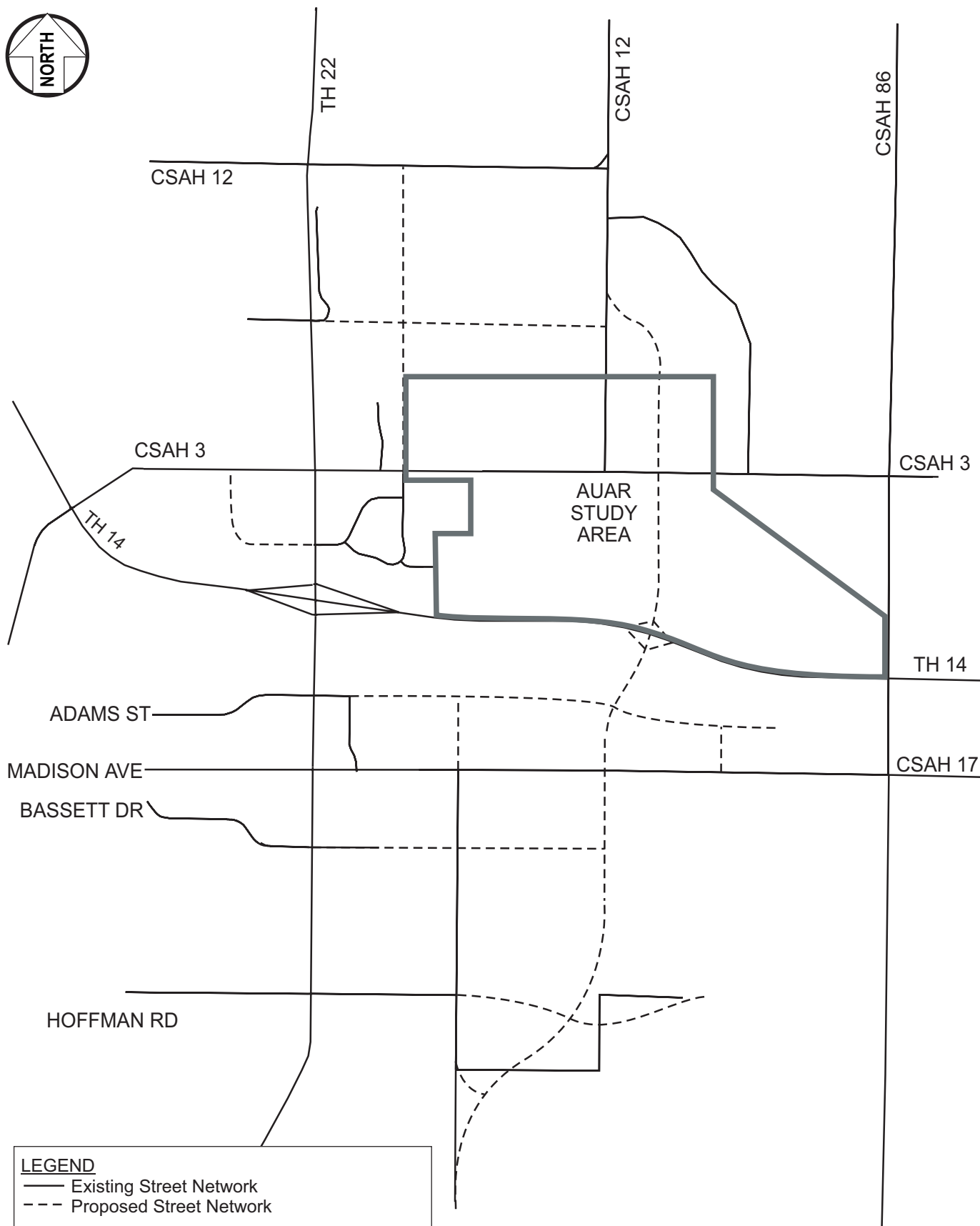
INTRODUCTION

SRF Consulting Group, Inc. conducted a traffic study for the City of Mankato to assist the city in planning for future infrastructure in the northeast area of the city (see Figure 1: Study Area). This study is part of an AUAR that is evaluating the impacts of future development in this area. This memorandum focuses on assessing the traffic-related impacts of future developments in this area of the city and identifies the infrastructure necessary to support these developments.

The NE Mankato AUAR traffic study analyzed PM peak hour traffic conditions in years 2009 and 2025 under several scenarios listed below. The analysis focused on the PM peak hour because of the commercial activities that dominate land use in the area (this period is the worst case scenario).

- 2009 without development in the AUAR area
- 2009 with initial AUAR development (distribution center only) - development consists of a 1,052,000 square foot distribution center. The 2009 analysis with initial AUAR development assumes this distribution center is operating.
- 2025 without AUAR development
- 2025 with AUAR development Scenario A
- 2025 with AUAR development Scenario B

The land uses for Scenarios A and B are summarized in Table 1 and illustrated in Figures 2 and 3.



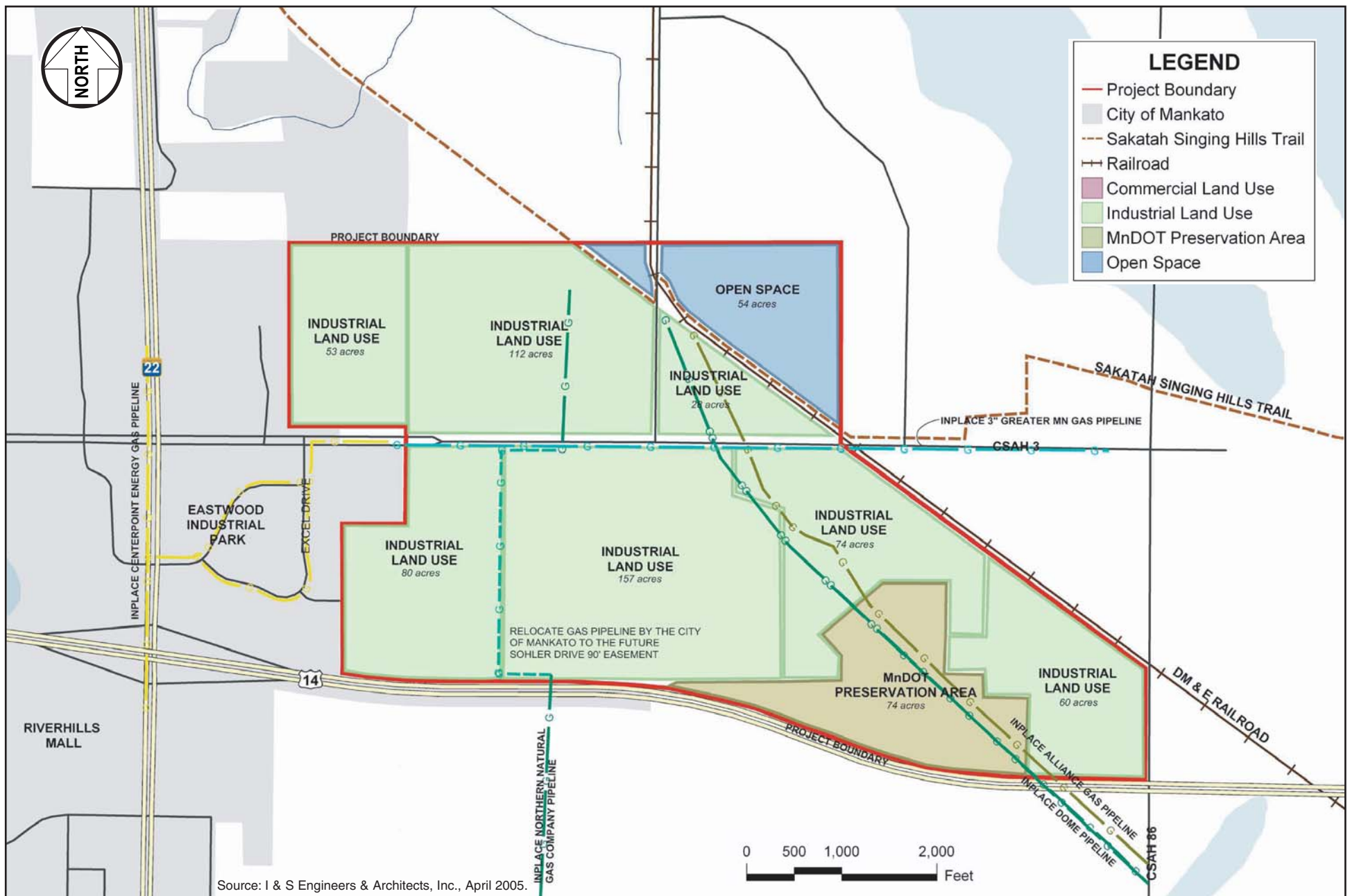
Graphic Support #5367 Mankato



STUDY AREA

NORTHEAST MANKATO AUAR TRAFFIC STUDY
City of Mankato

Figure 1



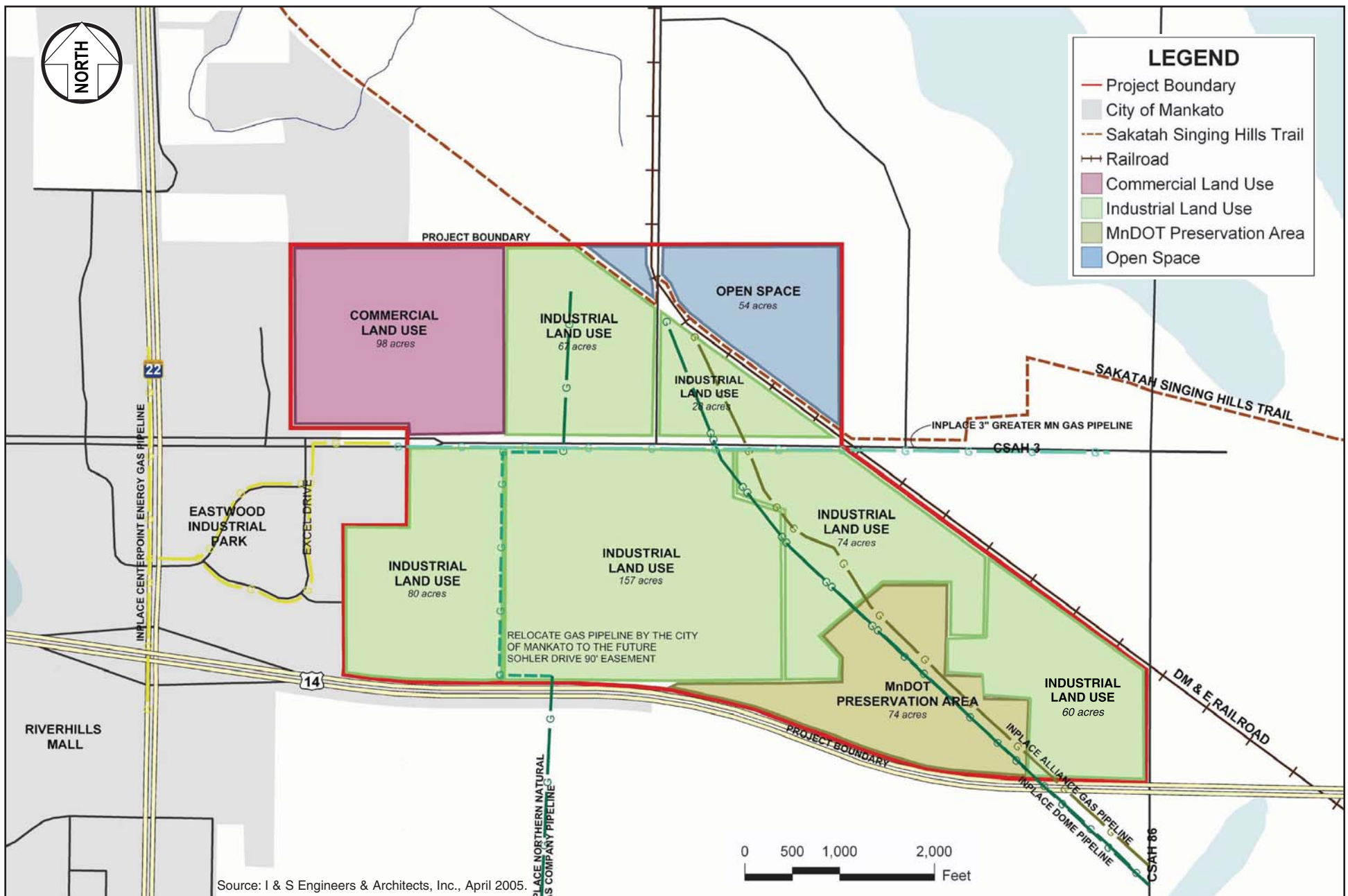


Table 1
Year 2025 AUAR Land Use Summary

Future Land Use Type	Scenario A	Scenario B
Commercial	None	98 acres
Industrial	564 acres ⁽¹⁾	466 acres ⁽¹⁾
Open Space	54 acres	54 acres
Mn/DOT Preservation Area	74 acres	74 acres

⁽¹⁾ Includes the distribution center assumed to operate in 2009.

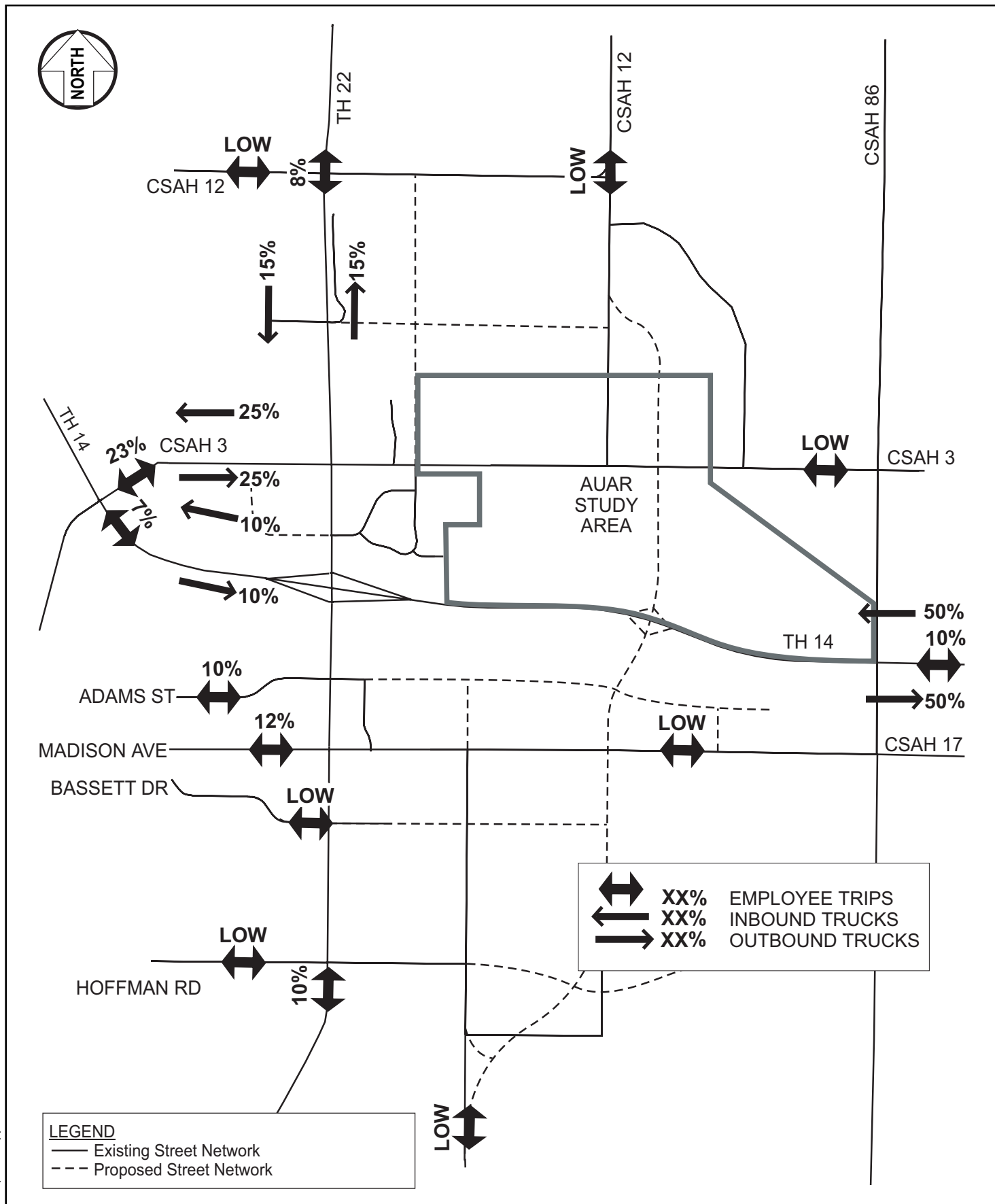
EXISTING CONDITONS

The AUAR traffic study did not analyze existing conditions. A previous memorandum done for the MATAPS Northeast Area Study, that covered the same areas as the current study, analyzed 2002 PM Peak hour traffic conditions. The Synchro/SimTraffic model results indicated that all study intersections operated at Level of Service (LOS) C or better, with 2002 traffic controls and geometrics.

2009 ANALYSIS

The purpose of an AUAR traffic study is to test the impact of various land use scenarios and develop strategies to mitigate its impacts. To isolate the effects of the AUAR development, the study analyzed traffic conditions that included background development only, i.e., no development in the AUAR area, but development outside the AUAR area. This development consisted of two parts: traffic passing through the study area road network and traffic generated by development occurring in the study area, but outside the AUAR area. The study assumed pass-through traffic increased by one percent per year and about 35 percent of the development anticipated by 2025 would occur by 2009 (about 4,000 trips in the PM peak hour). Table 2 summarizes the development assumed outside and inside the AUAR area by 2009; Appendix A gives a more detailed summary of the land use assumptions. The land use assumptions were supplied by the City of Mankato.

The study used the background development, AUAR land use assumptions, and Institute of Transportation Engineers (ITE) trip generation rates to develop trip generation estimates for the PM peak hour for each area of development. The added trips and existing travel patterns (shown in Figure 4) were used in Traffix software to develop turn movements at study intersections. Prior to adding growth to the 2002 base counts (which were used to



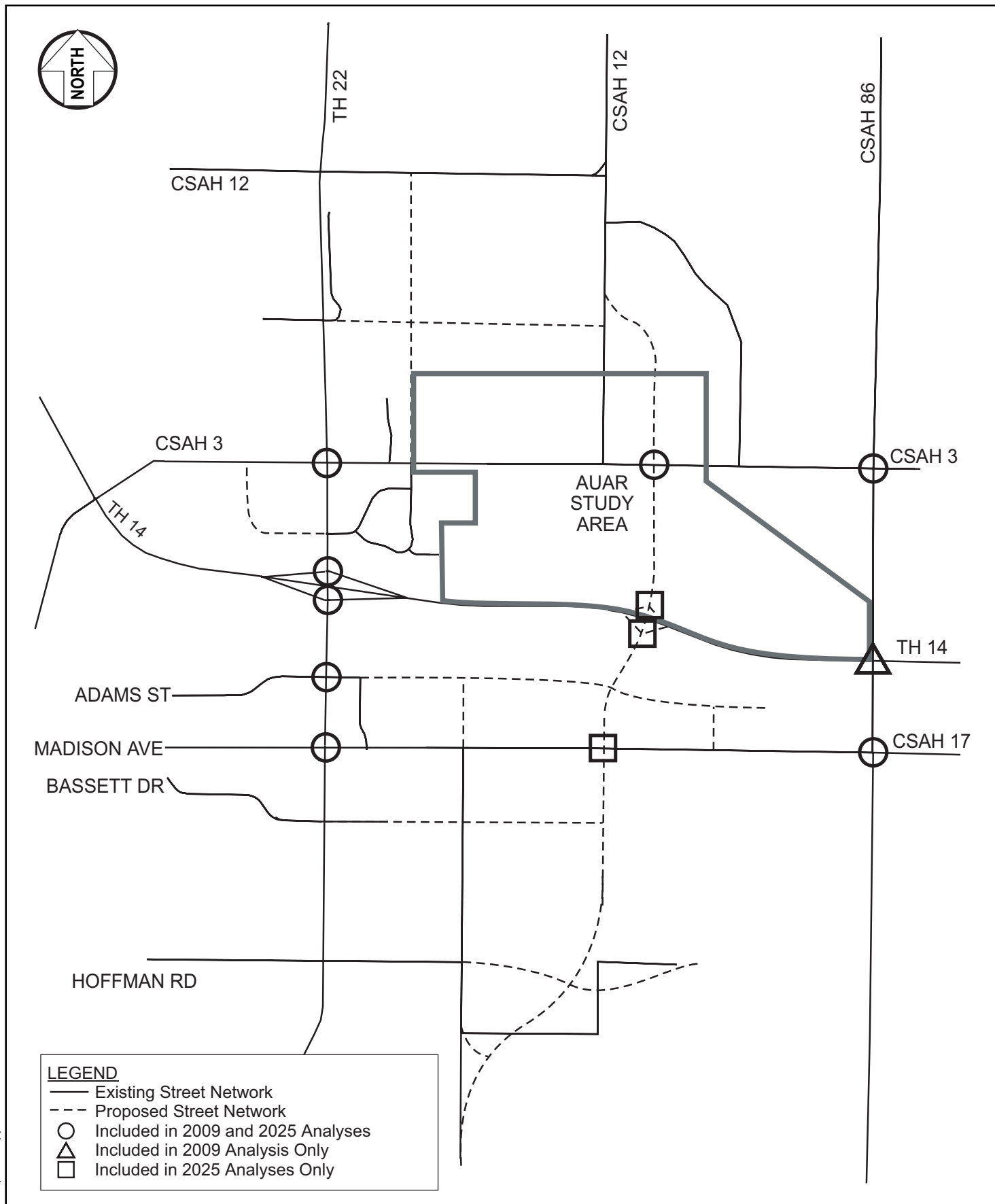
approximate pass-through trips), some adjustments were made to the 2002 base counts to account for the Victory Drive extension that opened in 2004 and connects Madison Avenue to the CSAH 3 interchange at TH 14 (2002 volumes were adjusted downward on TH 22 and on side streets from Madison Avenue to CSAH 3). Final 2009 turn movements were based on 2002 base counts adjusted for the Victory Drive extension and grown one percent per year and trips generated by development inside and outside the AUAR area. It should be noted that updated turn movement counts were not available to assess the Victory Drive impact.

Table 2
Year 2009 Land Use Summary

Future Land Use Type	Outside AUAR Area		Inside AUAR Area	
	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips
Commercial	1,189,000 s.f.	3,179	None	0
Industrial	None	0	1,052,000	289
Residential	533 units	483	None	0
Additional PM Peak Hour Trips		3,662		289

The Traffix model was run to obtain turning movement volumes with and without the AUAR development. Turning movement output from the Traffix model was then input into a Syncho/SimTraffic model for operations analysis. Traffic operations at key intersections were analyzed to determine the impact of the AUAR development during the PM peak hour. Figure 5 shows the following key intersections were analyzed in the 2009 scenarios:

- TH 22 and CSAH 3
- TH 22 and TH 14 North Ramps
- TH 22 and TH 14 South Ramps
- TH 22 and Adams Street
- TH 22 and Madison Avenue
- CSAH 12 and CSAH 3
- CR 86 and CSAH 3
- CR 86 and TH 14
- CR 86 and Madison Avenue



Assumed Roadway Improvements and Results of 2009 Analysis

The assumed roadway network and geometrics was a second factor in the 2009 analysis. A total of four 2009 scenarios were analyzed, scenarios with and without AUAR development and with and without roadway improvements. Table 3 summarizes the results. The 2009 analyses with roadway improvements include the following at the TH 22 and Adams Street intersection:

- Westbound to northbound right turn bay
- A second eastbound to northbound left turn bay (making this movement a dual left)

Table 3
Year 2009 Intersection Level of Service Results

Intersection	No Roadway Improvements		With Roadway Improvements	
	No AUAR Development	Initial AUAR Development	No AUAR Development	Initial AUAR Development
TH 22 and CSAH 3	C	C	C	C
TH 22 and TH 14 North Ramps	B	B	B	B
TH 22 and TH 14 South Ramps	B	B	B	B
TH 22 and Adams Street	F	F	D	D
TH 22 and Madison Avenue	C	C	C	C
<i>CSAH 12 and CSAH 3</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>A</i>
<i>CR 186 and CSAH 3</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>A</i>
<i>CR 186 and TH 14</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
<i>CR 186 and Madison Avenue</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>

Italics denote the intersection is unsignalized.

The results suggest the proposed AUAR development has little impact on key intersection operations in 2009. With no improvements, the TH 22 and Adams Street intersection is shown to operate at LOS F. With the stated improvements, its operations are shown to improve to LOS D.

2025 ANALYSIS

The same process was used to develop 2025 traffic information, with one exception, the 2002 base volumes were adjusted for additional factors (in addition to the Victory Drive extension): the opening of a CSAH 12 extension continuing from its current alignment east of TH 22 south past Madison Avenue including an interchange at TH 14, and the conversion of the TH 14/CR 86 intersection into a CR 86 overpass (with no access to or from TH 14). The following key intersections were analyzed in the 2025 scenarios (shown in Figure 5):

- TH 22 and CSAH 3
- TH 22 and TH 14 North Ramps
- TH 22 and TH 14 South Ramps
- TH 22 and Adams Street
- TH 22 and Madison Avenue
- CSAH 12 and CSAH 3 ⁽¹⁾
- CSAH 12 and TH 14 North Ramps ^{(1),(2)}
- CSAH 12 and TH 14 South Ramps ^{(1),(2)}
- CSAH 12 and Madison Avenue ⁽¹⁾
- CR 86 and CSAH 3
- CR 86 and Madison Avenue

Table 4 summarizes the 2025 land use assumptions. The number of peak hour trips generated by the entire study area (inside and outside the AUAR area) range from 75 to 80 percent of those generated by the original MATAPS NE Area Study (i.e., the current study assumes less intense land use than that assumed in the 2002 MATAPS NE Area Study).

Assumed Roadway Improvements and Results of 2025 Analysis

2025 Base Road Network

The 2025 land use assumed outside of the AUAR area is substantial. Because of the substantial growth assumptions, the study team assumed that all 2025 development scenarios include the proposed street network shown in Figure 5 (both the solid and dashed lines). Improvements include a CSAH 12 extension⁽¹⁾, a TH 14/CSAH 12 interchange⁽²⁾, and a TH 14/CR 86 overpass among others. These improvements are consistent with findings from previous studies. All intersections analyzed on the new CSAH 12 corridor were also assumed to be signalized. These improvements were considered the “Base Network” for the roadway system. Even with the new TH 14/CSAH 12 interchange and CSAH 12 extension, Table 5 shows that the Base Network roadway system is not capable of supporting even the background development as most analyzed intersections on TH 22 operate at LOS F. When additional development is added in AUAR Scenarios A and B, operations continue to be poor on the TH 22 corridor, and worsen at some intersections on the CSAH 12 corridor.

2025 Initial Roadway Improvements

The No AUAR development scenario with roadway improvements included a number of geometric improvements as well as signal phasing changes. Figure 6 illustrates the geometric improvements required to address the majority of the operational problems caused by growth outside the AUAR area. In addition to these improvements, overlapping right turn signal phasing (the right turn receives a green arrow at the same time as a complimentary left turn) was added for the eastbound to southbound right turns at the TH 22 and CSAH 3 intersection, for the westbound to northbound right turns at the TH 22 and Adams Street intersection, for

⁽¹⁾ CSAH 12 was analyzed with one lane in each direction with right and left turn lanes.

⁽²⁾ The north and south ramps were assumed to be a parclo interchange design (i.e., folded diamond in the northwest and southeast quadrants).

Table 4
Year 2025 Land Use Summary

Future Land Use Type	Outside AUAR Area		Inside AUAR Area – Scenario A		Inside AUAR Area – Scenario B	
	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips
Commercial	2,631,100 sq. ft.	6,627	None	0	384,200 sq. ft.	1,065
Industrial	68,000 sq. ft.	67	2,161,500 sq. ft.	1,528	1,841,300 sq. ft.	1,070
Residential	1,750 units	1,673	None	0	None	0
Office or Medical Office	331,100 sq. ft.	753	None	0	None	0
Additional PM Peak Hour Trips		9,120		1,528		2,135

Table 5
Year 2025 Intersection Level of Service Results

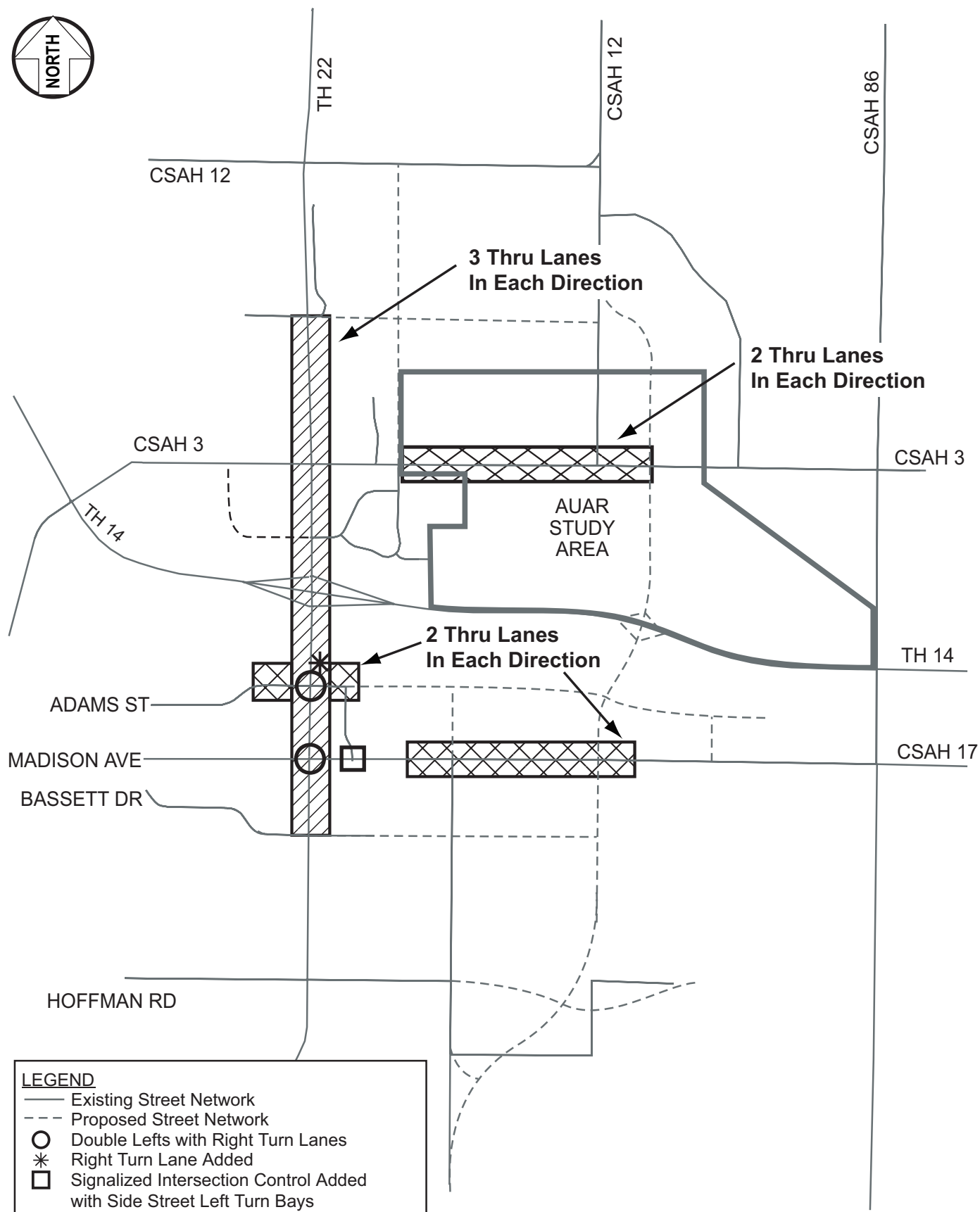
Intersection	Base Road Network ⁽¹⁾			Initial Roadway Improvements ⁽²⁾			Final Roadway Improvements ⁽³⁾		
	No AUAR	AUAR Development		No AUAR	AUAR Development		No AUAR	AUAR Development	
	Development	Scen. A	Scen. B	Development	Scen. A	Scen. B	Development	Scen. A	Scen. B
TH 22 and CSAH 3	F	F	F	D	D	E	C	D	D
TH 22 and TH 14 North Ramps	F	F	F	C	C	D	C	C	C
TH 22 and TH 14 South Ramps	D	D	D	C	C	D	B	B	B
TH 22 and Adams Street	F	F	F	D	D	D	D	D	D
TH 22 and Madison Avenue	F	F	F	D	D	D	D	D	D
CSAH 12 and CSAH 3	B	C	C	B	C	C	B	C	C
CSAH 12 and TH 14 North Ramps	B	B	B	B	B	B	B	B	B
CSAH 12 and TH 14 South Ramps	B	B	B	B	B	B	B	B	B
CSAH 12 and Madison Avenue	B	B	C	B	B	C	B	B	C
<i>CR 186 and CSAH 3</i>	<i>A</i>	<i>B</i>	<i>B</i>	<i>A</i>	<i>B</i>	<i>B</i>	<i>A</i>	<i>B</i>	<i>B</i>
<i>CR 186 and Madison Avenue</i>	<i>A</i>	<i>B</i>	<i>B</i>	<i>A</i>	<i>B</i>	<i>B</i>	<i>A</i>	<i>B</i>	<i>B</i>

(1) = Level of Service using the Base Network for analysis.

(2) = Level of service using the Base Network plus improvements shown in Figure 6 (i.e., Initial Roadway Improvements).

(3) = Level of Service using the Base Network, Initial Roadway Improvements, plus improvements listed on page 14 (i.e., Final Roadway Improvements).

Italics denote the intersection is unsignalized.



Graphic Support #5367 Mankato



NO AUAR DEVELOPMENT WITH ROADWAY IMPROVEMENTS

NORTHEAST MANKATO AUAR TRAFFIC STUDY
City of Mankato

Figure 6

the westbound to northbound right turns at the at the TH 22 and Madison Avenue intersection, and for the westbound to northbound right turns at TH 22 and Bassett Drive.

With these improvements, all intersections operate at LOS D or better without development in the AUAR area and with AUAR development Scenario A. But with the more intense AUAR development (Scenario B), the intersection of TH 22 and CSAH 3 falls to LOS E.

2025 Final Roadway Improvements

To accommodate the additional traffic generated by AUAR development, the study team analyzed additional roadway improvements beyond those initially added to address growth outside the AUAR area. The identified improvements were:

- TH 22 and CSAH 3: second left turn bay added on the east and west approaches for the eastbound to northbound left turns and westbound to southbound left turns.
- CSAH 3 and Excel: intersection signalized, left turn bays added on Excel.

Table 5 shows that with the final roadway improvements, all intersections in all scenarios operate at LOS D or better. Comparing operations between the No AUAR development and AUAR development Scenario A, results show changes in operations at the following intersections:

- CR 86 and CSAH 3, CR 86 and Madison Avenue – fell from LOS A to LOS B.
- CSAH 12 and CSAH 3 – fell from LOS B to LOS C
- TH 22 and CSAH 3 – fell from LOS C to LOS D.

Doing the same comparison for the No AUAR development scenario and Scenario B, operations at the following intersections changed:

- CR 86 and CSAH 3, CR 86 and Madison Avenue – fell from LOS A to LOS B.
- CSAH 12 and CSAH 3, CSAH 12 and Madison Avenue – fell from LOS B to LOS C.
- TH 22 and CSAH 3 – fell from LOS C to LOS D.

FINDINGS AND RECOMMENDATIONS

1. In 2025, the studied land uses in Scenario A generate 1,528 trips in the PM peak hour, 2,135 trips in Scenario B. The AUAR Scenario A development comprises 14 percent of the total number of PM peak hour trips, 19 percent in Scenario B. Together with the background development, Scenario A generates 75 percent of the trips generated in the previous MATAPS study, and Scenario B generates 80 percent.
2. Thirty-five percent of the 2025 development (approximately 4,000 trips in the PM peak hour) is assumed to occur by 2009. The AUAR development assumed for 2009 comprises about 7 percent of the total 2009 assumed development.

3. Trip distribution is consistent with previous MATAPS work, including internal traffic rerouting to account for completion of the Victory Drive extension (affecting the 2009 and 2025 analyses) and the CSAH 12 extension (affecting the 2025 analyses).
4. For the 2009 analysis, Table 6 shows no additional roadway improvements are needed to accommodate the initial AUAR development beyond those needed to address background growth.
5. For the 2025 analysis, Table 6 shows some additional improvements are needed to support the additional development within the AUAR area. The improvements focus on the number of left turn bays at the TH 22/CSAH 3 intersection and intersection control and the development of side-street left turn bays at the CSAH 3/Excel Drive intersection.
6. The City of Mankato, Blue Earth County, and the Minnesota Department of Transportation should work together to preserve right-of-way in and limit access to the CSAH 3, CSAH 12, Madison Avenue, and TH 22 corridors. These roadways are anticipated to have high traffic demands and serve important roles in the network. Their importance will continue to increase as the Mankato area continues to develop.
7. The TH 22 and Adams Street intersection is experiencing and will continue to experience operational problems because of its proximity to the River Hills Mall and its limited space for capacity expansion (the capacity of this intersection is constrained by existing development). The existing Adams Street capacity cannot adequately serve the long-term traffic demand. The City of Mankato should work toward developing options that address short- and long-term capacity needs. The city is in the process of conducting an Adams Street study to identify specific improvements.
8. Results show the CSAH 12 extension will function at an adequate level of service as a two-lane facility (one lane in each direction) with turn lanes for the 2025 land use scenarios analyzed. However, results from the Aggressive Growth analyses (see Appendix B), showed a need for a four-lane CSAH 12 plus turn lanes (two lanes in each direction). The study recommends planning CSAH 12 as a four-lane facility with turn lanes for the ultimate cross-section.

CC: Paul Vogel, City of Mankato
Ken Saffert, City of Mankato
Al Forsberg, Blue Earth County
Lisa Bigham, Mn/DOT

Table 6
Summary of Roadway Improvements

Improvements	No AUAR Development ⁽¹⁾	AUAR Development ⁽²⁾	MATAPS Findings ⁽³⁾
2009			
1. Dual left with right turn lane on Adams Street at TH 22/Adams Street intersection	✓	✓	2009 Not Analyzed
2025			
A. Six-lane TH 22 (Basset to Augusta)	✓	✓	✓
B. Dual left turn bays with right turn bays on all approaches at:			
▪ TH 22 and CSAH 3		✓	✓
▪ TH 22 and Adams Street	✓	✓	✓
▪ TH 22 and Madison Avenue	✓	✓	✓
C. CSAH 12 extended with TH 14/CSAH 12 interchange ⁽⁴⁾	✓	✓	Did not recommend interchange
D. Four-lane CSAH 3 from Excel to CSAH 12 with turn lanes	✓	✓	✓
E. Four-lane Madison Avenue (east of TH 22 to CSAH 12) with turn lanes	✓	✓	✓
F. Four-lane Adams Street	✓	✓	✓
G. Right-in/right-out access at Premiere Drive on west side of TH 22 (east side exists today)	✓	✓	✓
H. Signalize CSAH 3 and Excel Drive intersection and add side-street left turn bays		✓	
I. Signalize Madison Avenue and TWP 353 and add side-street left turn bays	✓	✓	
J. Overlapping right turn signal phasing for:	✓	✓	
▪ West approach at TH 22 and CSAH 3	✓	✓	Recommends dual right turn lanes (TH 22/Madison - East approach only)
▪ East approach at TH 22 and Adams Street	✓	✓	
▪ East approach at TH 22 and Madison Avenue	✓	✓	
▪ East approach at TH 22 and Bassett Drive	✓	✓	

⁽¹⁾ Check indicates improvement needed to address development outside the AUAR area.

⁽²⁾ Shaded cell with check indicates improvement needed to address AUAR development.

⁽³⁾ Check indicates consistency with previous MATAPS NE Area Study.

⁽⁴⁾ CSAH 12 extended was analyzed as two through lanes (one in each direction) with left and right turn bays. However, the Aggressive Growth analysis (see Appendix B) showed a need for four through lanes plus turn lanes. The study recommends planning CSAH 12 as a four-lane facility with turn lanes for the ultimate cross section.

Appendix A

**Land Use Assumptions and
Resulting 2025 PM Peak Hour Turn Movement Volumes
(Turn Movement Volumes for Scenario B only -
Worst Case Scenario)**

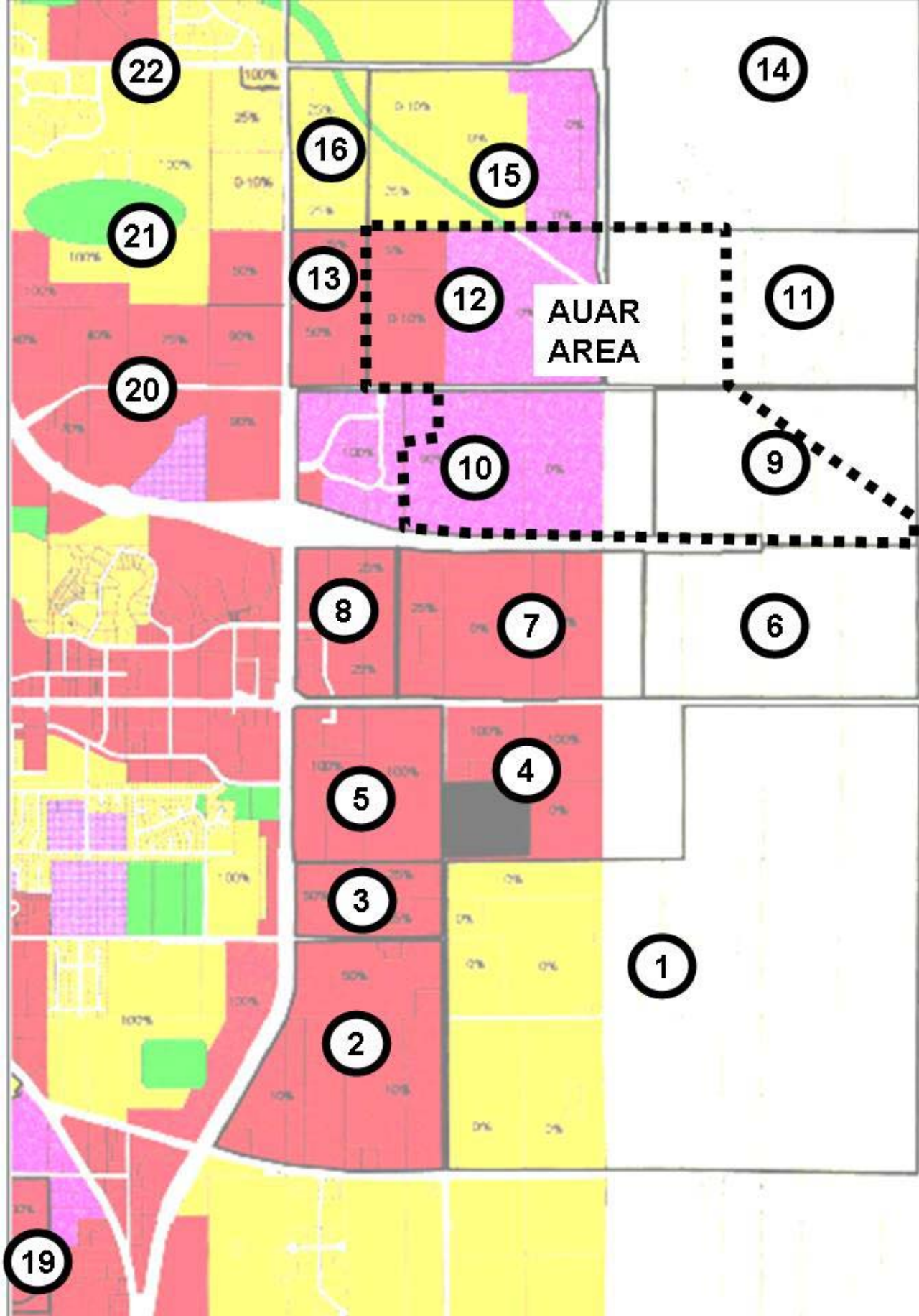


Figure A.1 Location of Assumed Land Uses (see Tables A.1 – A.3)

NE MANKATO AUAR Study - 2009 Analysis

Revised 6-6-05
Based on Land Use Revised 6-3-05

TABLE A.1
2009 FUTURE LAND USE ANALYSIS (ESTIMATED AREA AND TRIPS)⁽¹⁾

Traffic Zone Number	Map Zone Number	mi ²	Estimated Acreage	Estimated Square Footage	Existing Square Footage	Percent Developed ⁽⁶⁾	Reduced Square Footage	Floor Area Ratio (FAR)	Floor Area (sf) or # of Units	Total Generated PM Peak Hour Trips	Reduced Generated PM Peak Hour Trips ⁽⁷⁾	PM In (vph)	PM Out (vph)
17	2	0.6	360	15,681,600				4	0	0	0		
16	3	0.1	80	3,484,800				4	0	0	0		
14	4	0.4	160	6,969,600			0	0.18	0	0	0		
15	5	0.3	160	6,969,600	1,486,703	60%	2,695,057	0.18	485,110	1,775	1,243	596	646
12	6		220	9,583,200			0	0.18 / 0.15	0	0	0		
	6A		130	5,662,800			0	0.18	0	0	0		
	6B		90	3,920,400			0	0.15	0	0	0		
13	7	0.4	224	9,757,440			0	0.18	0	0	0		
11	8	0.2	96	4,181,760	1,209,666	50%	881,214	0.18	158,619	849	594	285	309
10	9		134	5,837,040			0	0.15	0	0	0		
9	10A ⁽⁸⁾		157	6,838,920		100%				88	88	44	44
20	10B ⁽⁸⁾		157	6,838,920		100%				201	201	70	131
8	10C		80	3,484,800			0	0.15	0	0	0		
21	11		28	1,219,680			0	0.15	0	0	0		
5	12	0.4	165	7,187,400			0	0.15	0	0	0		
4	13	0.1	80	3,484,800	855,083		-855,083	0.18		0	0		
3	15	0.4	240	10,454,400			0	4/15	0	0	0		
			80	3,484,800				4	0	0			
			80	3,484,800				4	0	0			
			80	3,484,800			0	0.15	0	0			
2	16	0.1	80	3,484,800				4	0	0	0		
18	19		219	9,546,900	609,840			4	0	0	0		
7	20 ⁽⁹⁾		329	14,338,500	1,271,363	30%	3,030,187	0.18	545,434	1,918	1,343	322 (total 645)	347 (total 698)
6	21 ⁽⁹⁾		209	9,084,075	1,350,360	75%		4	533	483	483	152 (total 304)	90 (total 179)
1	22 ⁽⁹⁾		83	3,617,900	651,418			4	0	0	0		

Notes:

⁽¹⁾ FAR and trip generation rates are based on assumptions from the River Hills Mall Study (MATAPS)

⁽²⁾ All residential developments are assumed to be low-density developments.

⁽³⁾ All commercial developments are assumed to be shopping centers with under 600,000 square feet.

⁽⁴⁾ All industrial developments are assumed to be light industrial developments.

⁽⁵⁾ Parks and public land are assumed to not generate trips in the PM peak hour.

⁽⁶⁾ Based on the amount of projected future growth (provided by the City of Mankato 6/3/05).

⁽⁷⁾ Includes a 30% reduction for all commercial trips.

⁽⁸⁾ Number of trips provided by developer. Distribution based on average ITE trip info for similar land uses

⁽⁹⁾ PM peak hour trips (in and out) were reduced by 50 percent, assuming that 50 percent of trips use of the TH 14/CSAH 3 interchange and the Victory Drive extension.

	Inside AUAF	Outside AUAR
Commercial	1,189,162	
Industrial		
Residential		

3,179

Land uses added or revised from original MATAPS NE Area Study assumptions
indicates residential development

NE MANKATO AUAR Study - 2025.A Analysis

Revised 6-7-05
Based on Land Use Revised 6/3/05

TABLE A.2
2025 SCENARIO A FUTURE LAND USE ANALYSIS (ESTIMATED AREA AND TRIPS)⁽¹⁾

Traffic Zone Number	Map Zone Number	mi ²	Estimated Acreage	Estimated Square Footage	Existing Square Footage	Percent Developed ⁽⁶⁾	Reduced Square Footage	Floor Area Ratio (FAR)	Floor Area (sf) or # of Units	Total Generated PM Peak Hour Trips	Reduced Generated PM Peak Hour Trips ⁽⁷⁾	PM In (vph)	PM Out (vph)
17	2	0.6	360	15,681,600		15%		4	216	214	214	135	79
16	3	0.1	80	3,484,800		40%		4	128	134	134	84	50
14	4	0.4	160	6,969,600		20%	1,393,920						
	4a - Commercial		80	3,484,800		20%	696,960	0.18	125,453	727	509	244	265
	4b - Church		80	3,484,800		20%	696,960	NA		0	0	3	2
15	5	0.3	160	6,969,600		90%	6,272,640	0.18 / 0.1 / ...					
	5a - Comm.		64	2,787,840	1,486,703	100%	1,301,137	0.18	234,205	1,098	768	369	400
	5b - Mn/DOT Office		40	1,742,400		100%	1,742,400	0.1	174,240	274	274	47	227
	5c - Clinic		20	871,200		100%	871,200	0.18	156,816	479	479	129	350
	5d - Nat'l Guard Armory		20	871,200		100%	871,200	0	0	0	0	0	5
12	6		174	7,579,440		6%	454,766	0.18 / 0.15	77,885				
	6A		46	2,003,760		10%	200,376	0.18	36,068	319	224	107	116
	6B		128	5,575,680		5%	278,784	0.15	41,818	-104	-104	5	36
13	7	0.4	224	9,757,440		20%	3,371,544	0.18	439,085	1,662	1,164	559	605
11	8	0.2	96	4,181,760	1,209,666	75%	1,926,654	0.18	346,798	1,422	996	478	518
10	9		118	5,140,080		5%	257,004	0.15	38,551	-108	-108	5	33
9	10A ⁽⁸⁾		157	6,838,920		100%			1,052,000	88	88	44	44
20	10B ⁽⁸⁾		157	6,838,920		100%				201	201	70	131
8	10C		80	3,484,800		100%	3,484,800	0.15	522,720	584	584	70	514
21	11		28	1,219,680		5%	60,984	0.15	9,148	-150	-150	1	8
5	12	0.4	165	7,187,400		50%	3,593,700	0.15	539,055	607	607	73	535
4	13	0.1	80	3,484,800	855,083	50%	887,317	0.18	159,717	853	597	286	310
3	15	0.4	240	10,454,400		13%	1,359,072	4/15	26,248				
			80	3,484,800		25%		4	80	88	88	55	32
			80	3,484,800		10%		4	32	38	38	24	14
			80	3,484,800		5%	174,240	0.15	26,136	-126	-126	3	23
2	16	0.1	80	3,484,800		50%		4	160	164	164	103	61
18	19		219	9,546,900	609,840	25%		4	205	205	205	129	76
7	20 ⁽⁹⁾		329	14,338,500	1,271,363	50%	12,172,493	0.18	1,289,812	3,385	2,369	569 (total 1138)	616 (total 1232)
6	21 ⁽⁹⁾		209	9,084,075	1,350,360	100%		4	710	626	626	197 (total 394)	115 (total 231)
1	22 ⁽⁹⁾		83	3,617,900	651,418	75%		4	204	204	204	65 (total 130)	38 (total 76)

Notes:

⁽¹⁾ FAR and trip generation rates are based on assumptions from the River Hills Mall Study (MATAPS)

⁽²⁾ All residential developments are assumed to be low-density developments.

⁽³⁾ All commercial developments are assumed to be shopping centers with under 600,000 square feet.

⁽⁴⁾ All industrial developments are assumed to be light industrial developments.

⁽⁵⁾ Parks and public land are assumed to not generate trips in the PM peak hour.

⁽⁶⁾ Based on the amount of projected future growth (provided by the City of Mankato 6/3/05).

⁽⁷⁾ Includes a 30% reduction for all commercial trips.

⁽⁸⁾ Number of trips provided by developer. Distribution based on average ITE trip info for similar land uses

⁽⁹⁾ PM peak hour trips (in and out) were reduced by 50 percent, assuming that 50 percent of trips use of the TH 14/CSAH 3 interchange and the Victory Drive extension.

	Outside AUA	Inside AUAR	Outside AU#	Inside AUAR
Commercial	2,631,137		6,627	
Industrial	67,954	2,161,473	67	1,527
Residential	1,736		1,674	
Office	331,056		753	

Land uses added or revised from original MATAPS NE Area Study assumptions

Land use revised for original MATAPS NE Area Study assumptions; new, assumed land use differs for 2025 AUAR Scenarios A and B.

indicates residential development

Estimated based on review of number of trip ends in peak hour from ITE Trip Generation Manual

No ITE information available.

Estimated based on comparison with other Mankato land uses (and, for the Mn/DOT facility, estimated number of employees)

NE MANKATO AUAR Study - 2025.B Analysis

Revised 6-7-05
Based on Land Use Revised 6/3/05

TABLE A.3

2025 SCENARIO B FUTURE LAND USE ANALYSIS (ESTIMATED AREA AND TRIPS)⁽¹⁾

Traffic Zone Number	Map Zone Number	mi ²	Estimated Acreage	Estimated Square Footage	Existing Square Footage	Percent Developed ⁽⁶⁾	Reduced Square Footage	Floor Area Ratio (FAR)	Floor Area (sf) or # of Units	Total Generated PM Peak Hour Trips	Reduced Generated PM Peak Hour Trips ⁽⁷⁾	PM In (vph)	PM Out (vph)
17	2	0.6	360	15,681,600		15%		4	216	214	214	135	79
16	3	0.1	80	3,484,800		40%		4	128	134	134	84	50
14	4	0.4	160	6,969,600		20%	1,393,920						
			80	3,484,800		20%	696,960	0.18	125,453	727	509	244	265
			80	3,484,800		20%	696,960	NA		0	0	3	2
15	5	0.3	160	6,969,600	1,486,703	90%	4,785,937	0.18 / 0.1 / ..					
	5a - Comm.		64	2,787,840	1,486,703	100%	1,301,137	0.18	234,205	1,098	768	369	400
	5b - Mn/DOT Office		40	1,742,400		100%	1,742,400	0.1	174,240	274	274	47	227
	5c - Clinic		20	871,200		100%	871,200	0.18	156,816	479	479	129	350
	5d - Nat'l Guard Armory		20	871,200		100%	871,200	0	0	0	0	0	5
12	6		174	7,579,440		6%	454,766	0.18 / 0.15	77,885				
	6A		46	2,003,760		10%	200,376	0.18	36,068	319	224	107	116
	6B		128	5,575,680		5%	278,784	0.15	41,818	-104	-104	5	36
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20	10B ⁽⁸⁾		157	6,838,920		100%				201	201	70	131
8	10C		80	3,484,800		100%	3,484,800	0.15	522,720	584	584	70	514
21	11		28	1,219,680		5%	60,984	0.15	9,148	-150	-150	1	8
5	12	0.4	165	7,187,400		50%	3,593,700	0.15 / 0.18	603,088				
	12A		67	2,918,520		50%	1,459,260	0.15	218,889	150	150	18	132
	12B		98	4,268,880		50%	2,134,440	0.18	384,199	1,522	1,065	511	554
4	13	0.1	80	3,484,800	855,083	50%	887,317	0.18	159,717	853	597	286	310
3	15	0.4	240	10,454,400		13%	1,359,072	4/15	26,248				
			80	3,484,800		25%		4	80	88	88	55	32
			80	3,484,800		10%		4	32	38	38	24	14
			80	3,484,800		5%	174,240	0.15	26,136	-126	-126	3	23
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18	19		219	9,546,900	609,840	25%		4	205	205	205	129	76
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6	21 ⁽⁹⁾		209	9,084,075	1,350,360	100%		4	710	626	626	197 (total 394)	115 (total 231)
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Notes:

⁽¹⁾ FAR and trip generation rates are based on assumptions from the River Hills Mall Study (MATAPS)

⁽²⁾ All residential developments are assumed to be low-density developments.

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⁽⁵⁾ Parks and public land are assumed to not generate trips in the PM peak hour.

⁽⁶⁾ Based on the amount of projected future growth (provided by the City of Mankato 6/3/05).

⁽⁷⁾ Includes a 30% reduction for all commercial trips.

⁽⁸⁾ Number of trips provided by developer. Distribution based on average ITE trip info for similar land uses

⁽⁹⁾ PM peak hour trips (in and out) were reduced by 50 percent, assuming that 50 percent of trips use of the TH 14/CSAH 3 interchange and the Victory Drive extension.

Land uses added or revised from original MATAPS NE Area Study assumptions

Land use revised for original MATAPS NE Area Study assumptions; new, assumed land use differs for 2025 AUAR Scenarios A and B.

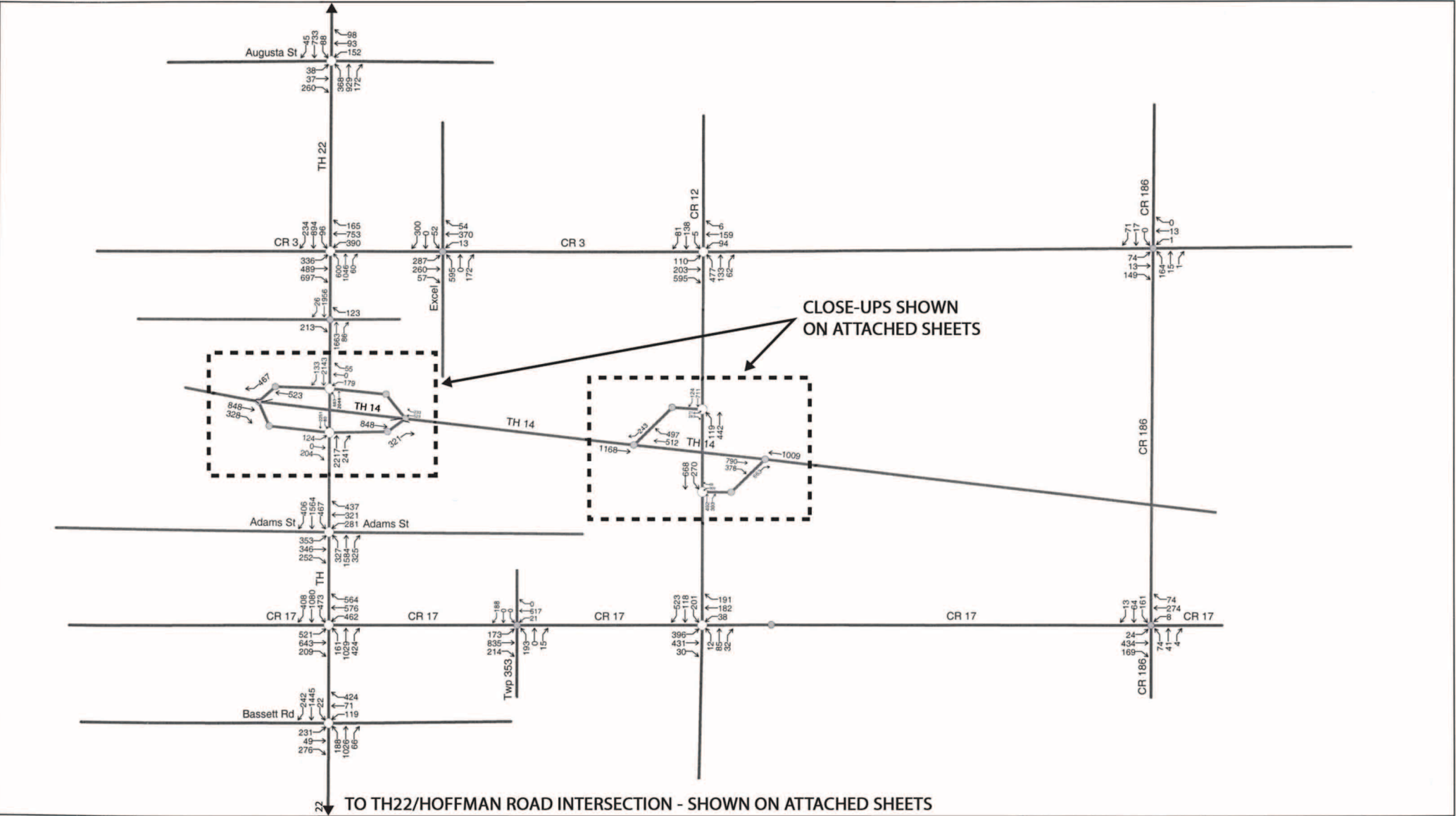
indicates residential development

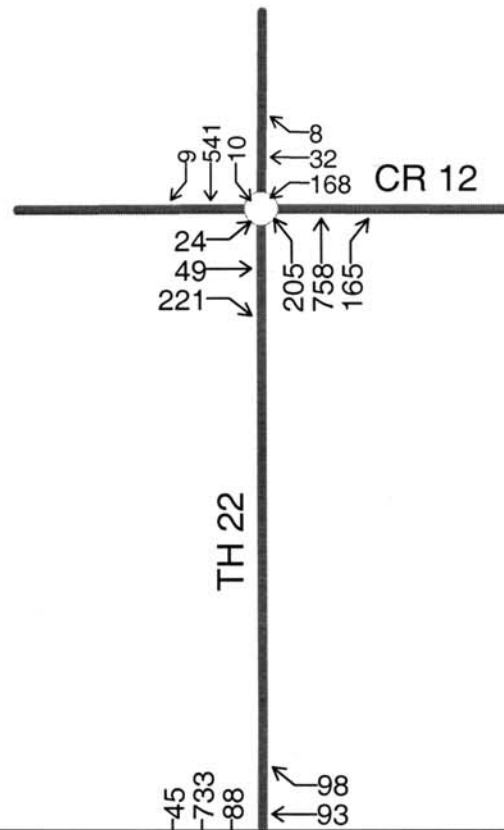
Estimated based on review of number of trip ends in peak hour from ITE Trip Generation Manual

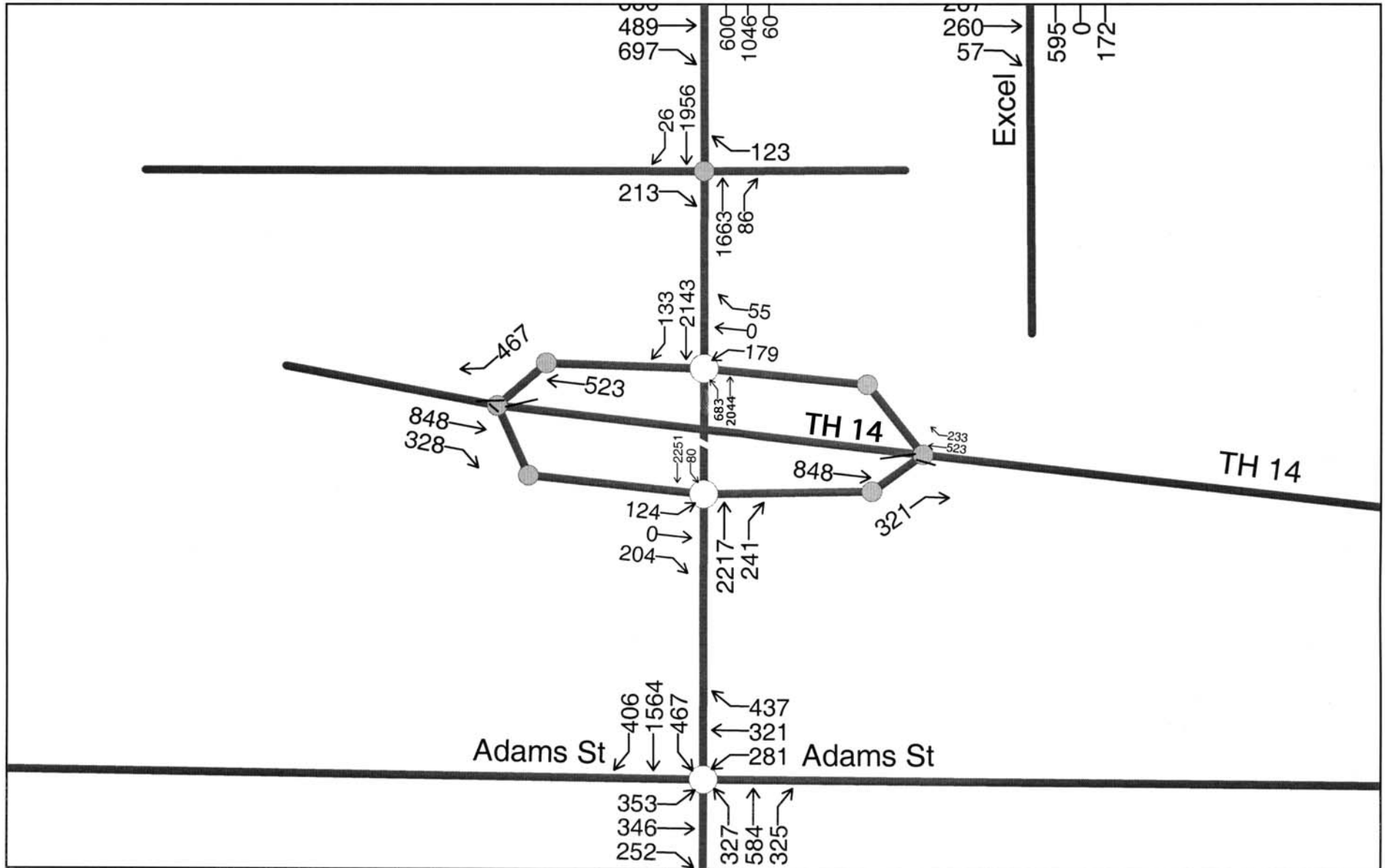
No ITE information available.

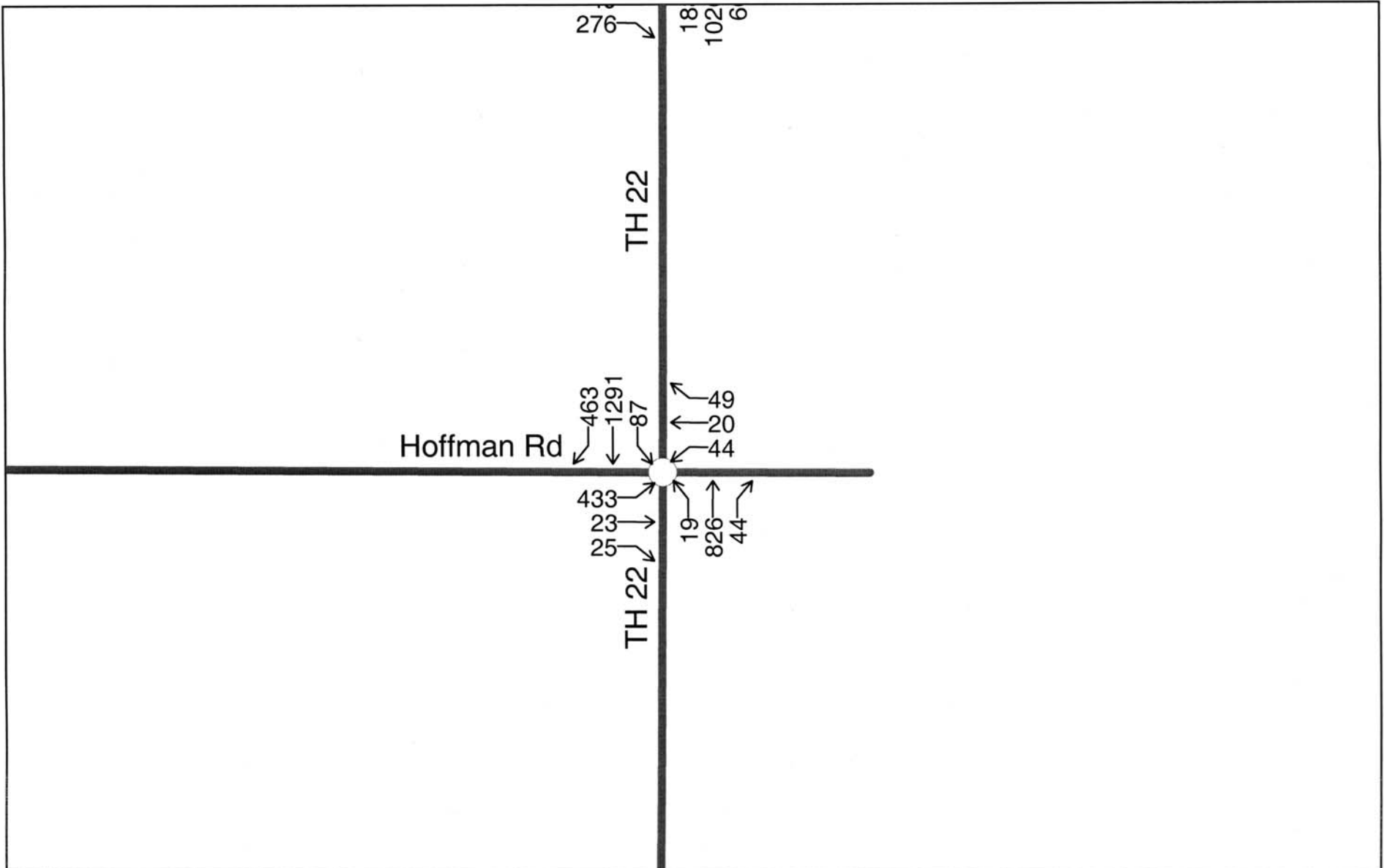
Estimated based on comparison with other Mankato land uses (and, for the Mn/DOT facility, estimated number of employees)

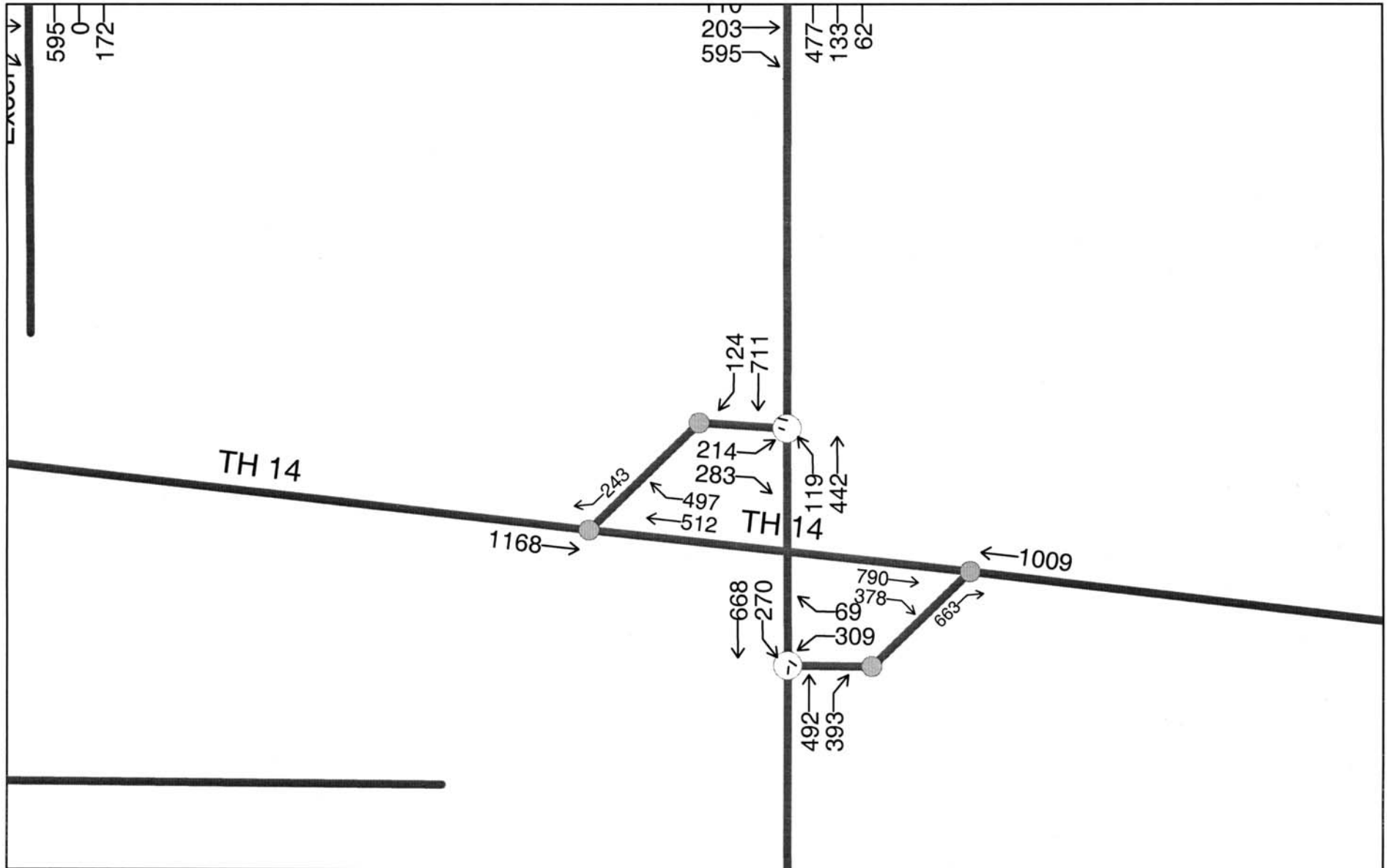
TO TH22/CSAH 12 INTERSECTION - SHOWN ON ATTACHED SHEETS











Appendix B

Aggressive Growth Traffic Analysis

Aggressive Growth Traffic Analysis

The study team analyzed the effects of a set of more aggressive growth assumptions. Tables B.1 and B.2 provide general summaries of the land use assumptions, while Figure B.1 along with Tables B.1, B.2, and B.3 provide a more detailed breakdown of the land use assumptions.

Table B.1
Year 2009 Aggressive Land Use Summary

Future Land Use Type	Outside AUAR Area		Inside AUAR Area	
	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips
Commercial	2,354,800 s.f.	4,692	None	0
Industrial	None	0	1,052,000 s.f.	290
Residential	530 units	538	None	0
Additional PM Peak Hour Trips		5,230		290

Table B.2
Year 2025 Aggressive Land Use Summary

Future Land Use Type	Outside AUAR Area		Inside AUAR Area – Scenario A		Inside AUAR Area – Scenario B	
	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips	Land Use Size	PM Peak Hour Trips
Commercial	7,088,176 sq. ft.	11,000	None	0	768,398 sq. ft.	1,685
Industrial	316,899 sq. ft.	310	4,096,844 sq. ft.	2,375	2,584,850 sq. ft.	3,435
Residential	3,622 units	2,590	None	0	None	0
Additional PM Peak Hour Trips		13,900		2,375		5,120

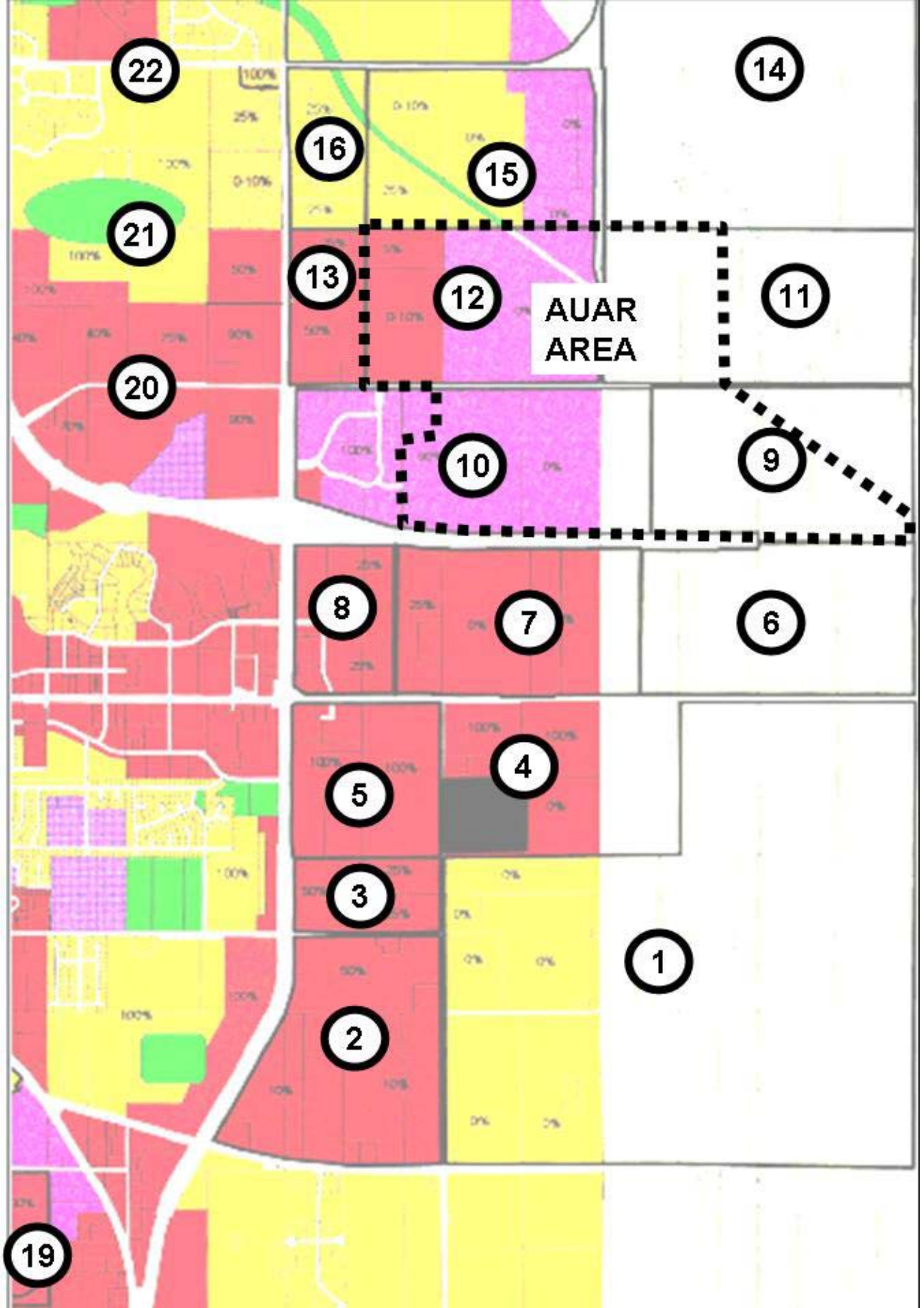


Figure B.1 Location of Assumed Land Uses – Aggressive Growth Analysis (see Tables B.3 – B.5)

NE MANKATO AUAR Study - 2009 Analysis

Revised 5-17-05
Based on First Land Use Received
Reduction is applied to square footage

TABLE B.3
2009 FUTURE LAND USE ANALYSIS (ESTIMATED AREA AND TRIPS)⁽¹⁾

Traffic Zone Number	Map Zone Number	mi ²	Estimated Acreage	Estimated Square Footage	Existing Square Footage	Percent Developed ⁽⁶⁾	Reduced Square Footage	Floor Area Ratio (FAR)	Floor Area (sf) or # of Units	Reduced Generated PM Peak Hour Trips ⁽⁷⁾	PM In (vph)	PM Out (vph)
17	2	0.6	360	15,681,600				4	0	0		
16	3	0.1	80	3,484,800				4	0	0		
14	4	0.4	160	6,969,600			0	0.18	0	0		
15	5	0.3	160	6,969,600	1,486,703	60%	2,695,057	0.18	485,110	1,256	596	646
12	6		220	9,583,200			0	0.18 / 0.15	0	0		
	6A		130	5,662,800			0	0.18	0	0		
	6B		90	3,920,400			0	0.15	0	0		
13	7	0.4	224	9,757,440			0	0.18	0	0		
11	8	0.2	96	4,181,760	1,209,666	50%	881,214	0.18	158,619	616	285	309
10	9		134	5,837,040			0	0.15	0	0		
9	10A ⁽⁸⁾		157	6,838,920		100%				88	44	44
20	10B ⁽⁸⁾		157	6,838,920		100%				201	70	131
8	10C		80	3,484,800			0	0.15	0	0		
21	11		28	1,219,680			0	0.15	0	0		
5	12	0.4	165	7,187,400			0	0.15	0	0		
4	13	0.1	80	3,484,800	855,083		-855,083	0.18		0		
3	15	0.4	240	10,454,400			0	4/.15	0	0		
			80	3,484,800				4	0			
			80	3,484,800				4	0			
			80	3,484,800			0	0.15	0			
2	16	0.1	80	3,484,800				4	0	0		
18	19		219	9,546,900	609,840			4	0	0		
7	20 ⁽⁹⁾		329	14,338,500	1,271,363	66%	9,505,956	0.18	1,711,072	2,804	685 (total 1371)	742 (total 1485)
6	21 ⁽⁹⁾		209	9,084,075	1,350,360	75%		4	533	538	170 (total 339)	100 (total 199)
1	22 ⁽⁹⁾		83	3,617,900	651,418			4	0	0		

Notes:

⁽¹⁾ FAR and trip generation rates are based on assumptions from the River Hills Mall Study (MATAPS)

⁽²⁾ All residential developments are assumed to be low-density developments.

⁽³⁾ All commercial developments are assumed to be shopping centers with under 600,000 square feet.

⁽⁴⁾ All industrial developments are assumed to be light industrial developments.

⁽⁵⁾ Parks and public land are assumed to not generate trips in the PM peak hour.

⁽⁶⁾ Based on the amount of projected future growth (provided by the City of Mankato - dark cells assumed by SRF, confirmed by City of Mankato).

⁽⁷⁾ Includes a 30% reduction for all commercial trips.

⁽⁸⁾ Number of trips provided by developer. Distribution based on average ITE trip info for similar land uses

⁽⁹⁾ PM peak hour trips (in and out) were reduced by 50 percent, assuming that 50 percent of trips use of the TH 14/CSAH 3 interchange and the Victory Drive extension.

assumed by mkk, checked by jb 5/12/05, revised by City of Mankato 5/17/05

Land uses added or revised from original MATAPS NE Area Study assumptions

indicates residential development

6/14/2005

NE MANKATO AUAR Study - 2025.A Analysis

Revised 5-17-05
Based on First Land Use Received
Reduction is applied to square footage

TABLE B.4
2025 SCENARIO A FUTURE LAND USE ANALYSIS (ESTIMATED AREA AND TRIPS)⁽¹⁾

Traffic Zone Number	Map Zone Number	mi ²	Estimated Acreage	Estimated Square Footage	Existing Square Footage	Percent Developed ⁽⁶⁾	Reduced Square Footage	Floor Area Ratio (FAR)	Floor Area (sf) or # of Units	Reduced Generated PM Peak Hour Trips ⁽⁷⁾	PM In (vph)	PM Out (vph)
17	2	0.6	360	15,681,600		16%		4	230	233	146	86
16	3	0.1	80	3,484,800		37%		4	118	120	75	44
14	4	0.4	160	6,969,600		38%	2,613,600	0.18	470,448	1,232	593	642
			80	3,484,800		50%	1,742,400	0.18	627,264	1,480		
			80	3,484,800		25%	871,200	0.18	627,264	1,480		
			0			0%	0	0	0	0		
15	5	0.3	160	6,969,600	1,486,703	88%	4,646,545	0.18	836,378	1,777	855	926
12	6		220	9,583,200		45%	4,312,440	0.18 / 0.15	723,314	1,471		
	6A		130	5,662,800		45%	2,548,260	0.18	458,687	1,212	578	626
	6B		90	3,920,400		45%	1,764,180	0.15	264,627	259	31	228
13	7	0.4	224	9,757,440		52%	3,371,544	0.18	606,878	1,449	691	749
11	8	0.2	96	4,181,760	1,209,666	75%	1,926,654	0.18	346,798	1,014	478	518
10	9		134	5,837,040		50%	2,918,520	0.15	437,778	429	56	407
9	10A ⁽⁸⁾		157	6,838,920		100%			1,052,000	88	44	44
20	10B ⁽⁸⁾		157	6,838,920		100%				201	70	131
8	10C		80	3,484,800		100%	3,484,800	0.15	522,720	512	61	451
21	11		28	1,219,680		50%	609,840	0.15	91,476	90	11	79
5	12	0.4	165	7,187,400		100%	7,187,400	0.15	1,078,110	1,057	127	930
4	13	0.1	80	3,484,800	855,083	75%	1,758,517	0.18	316,533	957	450	488
3	15	0.4	240	10,454,400		25%	2,613,600	4/.15	52,512	294		
			80	3,484,800		50%		4	160		102	60
			80	3,484,800		25%		4	80		51	30
			80	3,484,800		10%	348,480	0.15	52,272		6	45
2	16	0.1	80	3,484,800		75%		4	240	242	153	90
18	19		219	9,546,900	609,840	100%		4	821	829	522	307
7	20 ⁽⁹⁾		329	14,338,500	1,271,363	93%	12,172,493	0.18	2,191,049	3,282	807 (total 1614)	874 (total 1748)
6	21 ⁽⁹⁾		209	9,084,075	1,350,360	100%		4	710	717	226 (total 452)	132 (total 265)
1	22 ⁽⁹⁾		83	3,617,900	651,418	75%		4	204	206	65 (total 130)	38 (total 76)

Notes:

- ⁽¹⁾ FAR and trip generation rates are based on assumptions from the River Hills Mall Study (MATAPS)
⁽²⁾ All residential developments are assumed to be low-density developments.
⁽³⁾ All commercial developments are assumed to be shopping centers with under 600,000 square feet.
⁽⁴⁾ All industrial developments are assumed to be light industrial developments.
⁽⁵⁾ Parks and public land are assumed to not generate trips in the PM peak hour.
⁽⁶⁾ Based on the amount of projected future growth (provided by the City of Mankato - dark cells assumed by SRF, confirmed by City of Mankato).
⁽⁷⁾ Includes a 30% reduction for all commercial trips.
⁽⁸⁾ Number of trips provided by developer. Distribution based on average ITE trip info for similar land uses
⁽⁹⁾ PM peak hour trips (in and out) were reduced by 50 percent, assuming that 50 percent of trips use of the TH 14/CSAH 3 interchange and the Victory Drive extension.

assumed by mkk, checked by jb 5/12/05, revised by City of Mankato 5/17/05
Land uses added or revised from original MATAPS NE Area Study assumptions
Land use revised for original MATAPS NE Area Study assumptions; new, assumed land use differs for 2025 AUAR Scenarios A and B.
indicates residential development

NE MANKATO AUAR Study - 2025.B Analysis

Revised 5-17-05
Based on First Land Use Received
Reduction is applied to square footage

TABLE B.5
2025 SCENARIO B FUTURE LAND USE ANALYSIS (ESTIMATED AREA AND TRIPS)⁽¹⁾

Traffic Zone Number	Map Zone Number	mi ²	Estimated Acreage	Estimated Square Footage	Existing Square Footage	Percent Developed ⁽⁶⁾	Reduced Square Footage	Floor Area Ratio (FAR)	Floor Area (sf) or # of Units	Reduced Generated PM Peak Hour Trips ⁽⁷⁾	PM In (vph)	PM Out (vph)
17	2	0.6	360	15,681,600		16%		4	230	233	146	86
16	3	0.1	80	3,484,800		37%		4	118	120	75	44
14	4	0.4	160	6,969,600		38%	2,613,600	0.18	470,448	1,232	593	642
15	5	0.3	160	6,969,600	1,486,703	88%	4,646,545	0.18	836,378	1,777	855	926
12	6		220	9,583,200		45%	4,312,440	0.18 / 0.15	723,314	1,471		
	6A		130	5,662,800		45%	2,548,260	0.18	458,687	1,212	578	626
	6B		90	3,920,400		45%	1,764,180	0.15	264,627	259	31	228
13	7	0.4	224	9,757,440		52%	3,371,544	0.18	606,878	1,449	691	749
11	8	0.2	96	4,181,760	1,209,666	75%	1,926,654	0.18	346,798	1,014	478	518
10	9		134	5,837,040		50%	2,918,520	0.15	437,778	429	56	407
9	10A ⁽⁸⁾		157	6,838,920		100%				88	44	44
20	10B ⁽⁸⁾		157	6,838,920		100%				201	70	131
8	10C		80	3,484,800		100%	3,484,800	0.15	522,720	512	61	451
21	11		28	1,219,680		50%	609,840	0.15	91,476	90	11	79
5	12	0.4	165	7,187,400		100%	7,187,400	0.15 / 0.18	1,206,176	2,113		
	12A		67	2,918,520		100%	2,918,520	0.15	437,778	429	51	378
	12B		98	4,268,880		100%	4,268,880	0.18	768,398	1,684	808	875
4	13	0.1	80	3,484,800	855,083	75%	1,758,517	0.18	316,533	957	450	488
3	15	0.4	240	10,454,400		25%	2,613,600	4/.15	52,512	294		
			80	3,484,800		50%		4	160		102	60
			80	3,484,800		25%		4	80		51	30
			80	3,484,800		10%	348,480	0.15	52,272		6	45
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18	19		219	9,546,900	609,840	100%		4	821	829	522	307
7	20 ⁽⁹⁾		329	14,338,500	1,271,363	93%	12,172,493	0.18	2,191,049	3,282	807 (total 1614)	874 (total 1748)
6	21 ⁽⁹⁾		209	9,084,075	1,350,360	100%		4	710	717	226 (total 452)	132 (total 265)
1	22 ⁽⁹⁾		83	3,617,900	651,418	75%		4	204	206	65 (total 130)	38 (total 76)

Notes:

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- ⁽³⁾ All commercial developments are assumed to be shopping centers with under 600,000 square feet.
- ⁽⁴⁾ All industrial developments are assumed to be light industrial developments.
- ⁽⁵⁾ Parks and public land are assumed to not generate trips in the PM peak hour.
- ⁽⁶⁾ Based on the amount of projected future growth (provided by the City of Mankato - dark cells assumed by SRF, confirmed by City of Mankato).
- ⁽⁷⁾ Includes a 30% reduction for all commercial trips.
- ⁽⁸⁾ Number of trips provided by developer. Distribution based on average ITE trip info for similar land uses
- ⁽⁹⁾ PM peak hour trips (in and out) were reduced by 50 percent, assuming that 50 percent of trips use of the TH 14/CSAH 3 interchange and the Victory Drive extension.

assumed by mkk, checked by jb 5/12/05, revised by City of Mankato 5/17/05
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Land use revised for original MATAPS NE Area Study assumptions; new, assumed land use differs for 2025 AUAR Scenarios A and B.
indicates residential development

Assumed Roadway Improvements ⁽¹⁾ and Results of 2009 Aggressive Growth Analysis

A total of four 2009 aggressive growth scenarios were analyzed, scenarios with and without AUAR development and with and without roadway improvements. The aggressive growth analysis followed the same analysis process as that described in the memorandum for the less aggressive growth scenario. Table B.6 summarizes the result of the 2009 aggressive growth analysis. The 2009 aggressive growth analyses with roadway improvements include the following improvements at the TH 22 and Adams Street intersection:

- Westbound to northbound right turn bay
- A second eastbound to northbound left turn bay (making this movement a dual left)

Table B.6
Year 2009 Aggressive Growth Intersection Level of Service Results

Intersection	No Roadway Improvements		With Roadway Improvements	
	No AUAR Development	Initial AUAR Development	No AUAR Development	Initial AUAR Development
TH 22 and CSAH 3	D	D	D	D
TH 22 and TH 14 North Ramps	B	B	B	B
TH 22 and TH 14 South Ramps	B	B	B	B
TH 22 and Adams Street	F	F	D	D
TH 22 and Madison Avenue	C	C	C	C
<i>CSAH 12 and CSAH 3</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>A</i>
<i>CR 86 and CSAH 3</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
<i>CR 86 and TH 14</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>
<i>CR 86 and Madison Avenue</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>B</i>

Italics denote the intersection is unsignalized.

The results suggest the proposed AUAR development has little impact on key intersection operations in 2009. With no improvements, the TH 22 and Adams Street intersection is shown to operate at LOS F. With the stated improvements, its operations are shown to improve to the LOS D/E threshold. The intersection of TH 14 and CR 86 is shown to operate at LOS F ⁽¹⁾.

⁽¹⁾ Improvements address level of service issues off the TH 14 mainline only. The Synchro/SimTraffic results show the TH 14/CR 86 intersection at LOS F; this is due to delay on the stop-controlled CR 86 approaches. Signalizing this intersection would improve operations, but was not studied because the this solution is not consistent with the TH 14 long-term access plan. If safety problems occur at this location, a possible solution would be to covert this intersection to right-in/right-out only.

Assumed Roadway Improvements and Results of 2025 Aggressive Growth Analysis

The same process was used to develop 2025 traffic information, with one exception, the 2002 base volumes were adjusted for additional factors (in addition to the Victory Drive extension): the opening of a CSAH 12 extension continuing from its current alignment east of TH 22 south past Madison Avenue including an interchange at TH 14, and the conversion of the TH 14/CR 86 intersection into a CR 86 overpass (with no access to or from TH 14). Table B.2 summarizes the 2025 land use assumptions. The number of trips generated by the land uses assumed in the 2025 aggressive growth analysis range from 16 to 35 percent more than those generated by the original MATAPS NE Area Study.

2025 Base Road Network

Because of the aggressive growth assumptions, the study team assumed that all development scenarios include the proposed street network shown in Figure B.2 (both the solid and dashed lines). Improvements include a CSAH 12 extension⁽²⁾, a TH 14/CSAH 12 interchange⁽³⁾, and a TH 14/CR 86 overpass among others. These improvements are consistent with findings from previous studies. All intersections analyzed on the new CSAH 12 corridor were also assumed to be signalized. These improvements were considered the “Base Network” for the roadway system. Even with the new TH 14/CSAH 12 interchange and CSAH 12 extension, Table B.7 shows that the Base Network roadway system is not capable of supporting even the background development as all analyzed intersections on TH 22 operate at LOS F. When additional development is added in AUAR Scenarios A and B, operations continue to be poor on the TH 22 corridor, and worsen on the CSAH 12 corridor.

⁽²⁾ CSAH 12 was initially analyzed with one lane in each direction with right and left turn lanes. Where additional improvements are recommended in Scenarios A and B, CSAH 12 was analyzed with two lanes in each direction with right and left turn lanes (see discussion under “Final Roadway Improvements”).

⁽³⁾ The north and south ramps were assumed to be a parclo design (i.e., folded diamond in the northwest and southeast quadrants).

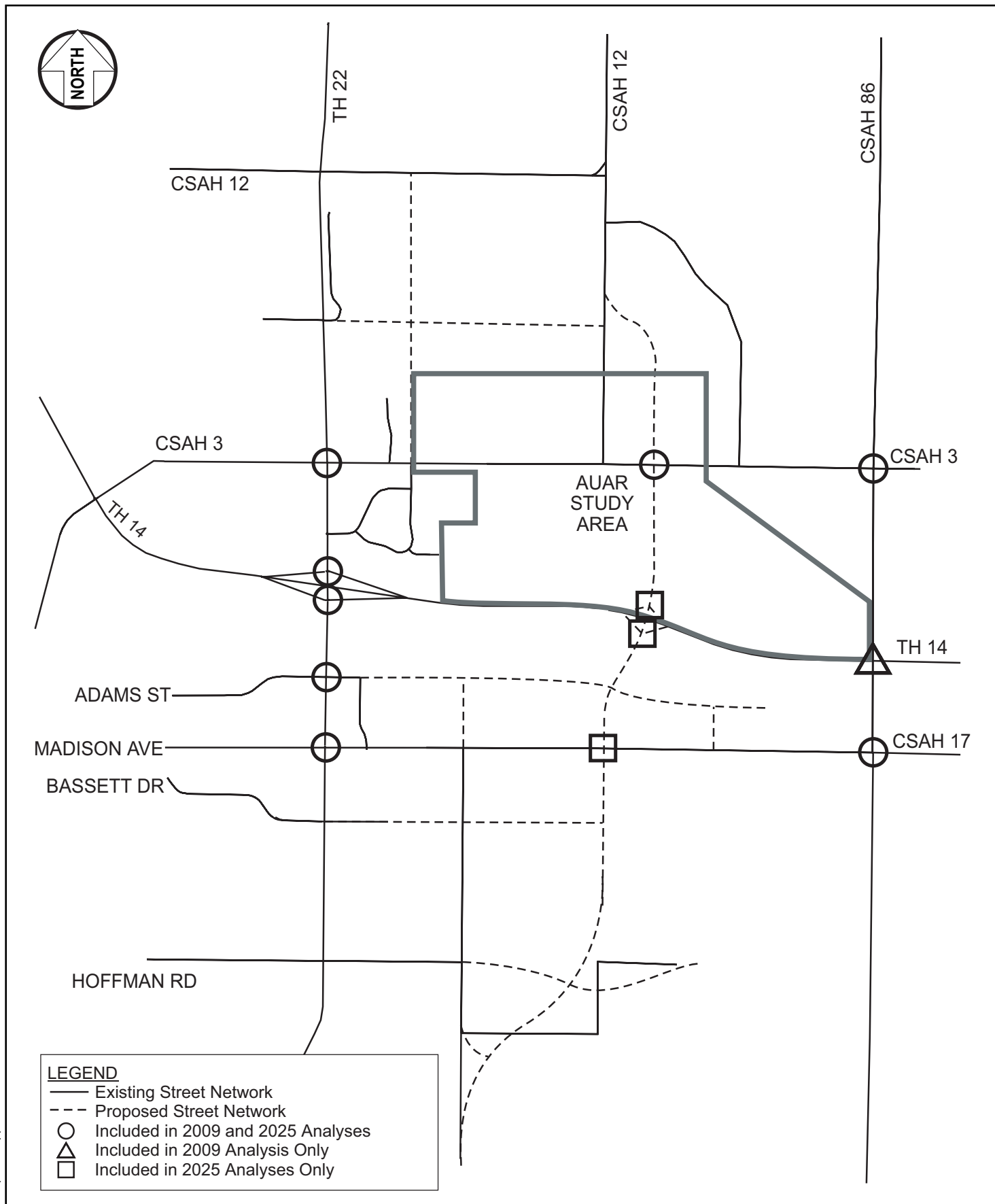


Table B.7
Year 2025 Aggressive Growth Intersection Level of Service Results

Intersection	Base Road Network ⁽¹⁾			Initial Roadway Improvements ⁽²⁾			Final Roadway Improvements ⁽³⁾		
	No AUAR	AUAR Development		No AUAR	AUAR Development		No AUAR	AUAR Development	
	Development	Scen. A	Scen. B	Development	Scen. A	Scen. B	Development	Scen. A	Scen. B
TH 22 and CSAH 3	F	F	F	F	F	F	F	F	F
TH 22 and TH 14 North Ramps	F	F	F	B	C	C	B	C	C
TH 22 and TH 14 South Ramps	E	E	F	B	B	C	B	B	C
TH 22 and Adams Street	F	F	F	F	F	F	F	F	F
TH 22 and Madison Avenue	F	F	F	E	F	F	E	F	F
CSAH 12 and CSAH 3	C	F	F	B	F	F	Not Analyzed	C	C
CSAH 12 and TH 14 North Ramps	B	D	F	B	D	F	Not Analyzed	B	B
CSAH 12 and TH 14 South Ramps	C	F	F	C	F	F	Not Analyzed	C	C
CSAH 12 and Madison Avenue	D	D	E	C	D	E	Not Analyzed	D	E
<i>CR 86 and CSAH 3</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
<i>CR 86 and Madison Avenue</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>D</i>

(1) = Level of Service using the Base Network for analysis.

(2) = Level of service using the Base Network plus improvements shown in Figure 6 (i.e., Initial Roadway Improvements).

(3) = Level of Service using the Base Network, Initial Roadway Improvements, plus improvements listed on page 14 (i.e., Final Roadway Improvements).

Italics denote the intersection is unsignalized.

2025 Initial Roadway Improvements

The No AUAR development scenario with roadway improvements included a number of geometric improvements as well as signal phasing changes. Figure B.3 illustrates the geometric improvements required to address the majority of the operational problems caused by growth outside the AUAR area. In addition to these improvements, overlapping right turn signal phasing (the right turn receives a green arrow at the same time as a complimentary left turn) was added for the eastbound to southbound right turns at the TH 22 and CSAH 3 intersection, for the westbound to northbound right turns at the TH 22 and Adams Street intersection, and for both the eastbound and westbound right turns at the at the TH 22 and Madison Avenue intersection.

With these improvements, three intersections continued to operate below LOS D: TH 22 and CSAH 3, TH 22 and Adams Street, and TH 22 and Madison Avenue. Additional side street capacity would be needed at each of the intersections to improve operations to LOS D or better. This capacity was not added because it was not considered feasible. All other intersections operated at LOS C or better.

Other options for improving roadway operations (aside from capacity addition) include modifications in land use densities in commercial areas or additional volume shifts to Victory Drive or CSAH 12. SRF could develop better volume approximations of shifts to facilities parallel to TH 22 if updated turning movement counts were available and/or travel time runs were conducted to better establish trip sheds. (SRF relied on 2002 counts, which were taken prior to the Victory Drive extension opening.) The operational issues on TH 22 are predominantly the results of growth located outside the AUAR area (this growth accounts for 73 to 85 percent of the total new peak hour trips generated in 2025).

2025 Final Roadway Improvements

To accommodate the additional traffic generated by aggressive growth AUAR development Scenarios A and B, the road network needed additional improvements. The identified improvements were the same for both aggressive growth land use Scenarios A and B and included:

- All improvements listed for the Initial Roadway Improvements
- CSAH 12: converted to two through lanes in each direction (replacing the assumed one lane in each direction)
- CSAH 3 and Excel: second left turn lane added on the south approach and overlapping right turn signal phasing added for the southbound to westbound right
- CSAH 3 and CSAH 12: second left turn lane added on the south approach, protected left turn phase added for northbound to westbound left added, and overlapping right turn signal phasing added for the southbound to westbound right
- Madison Avenue and CSAH 12: overlapping right turn signal phasing added for the southbound to westbound right

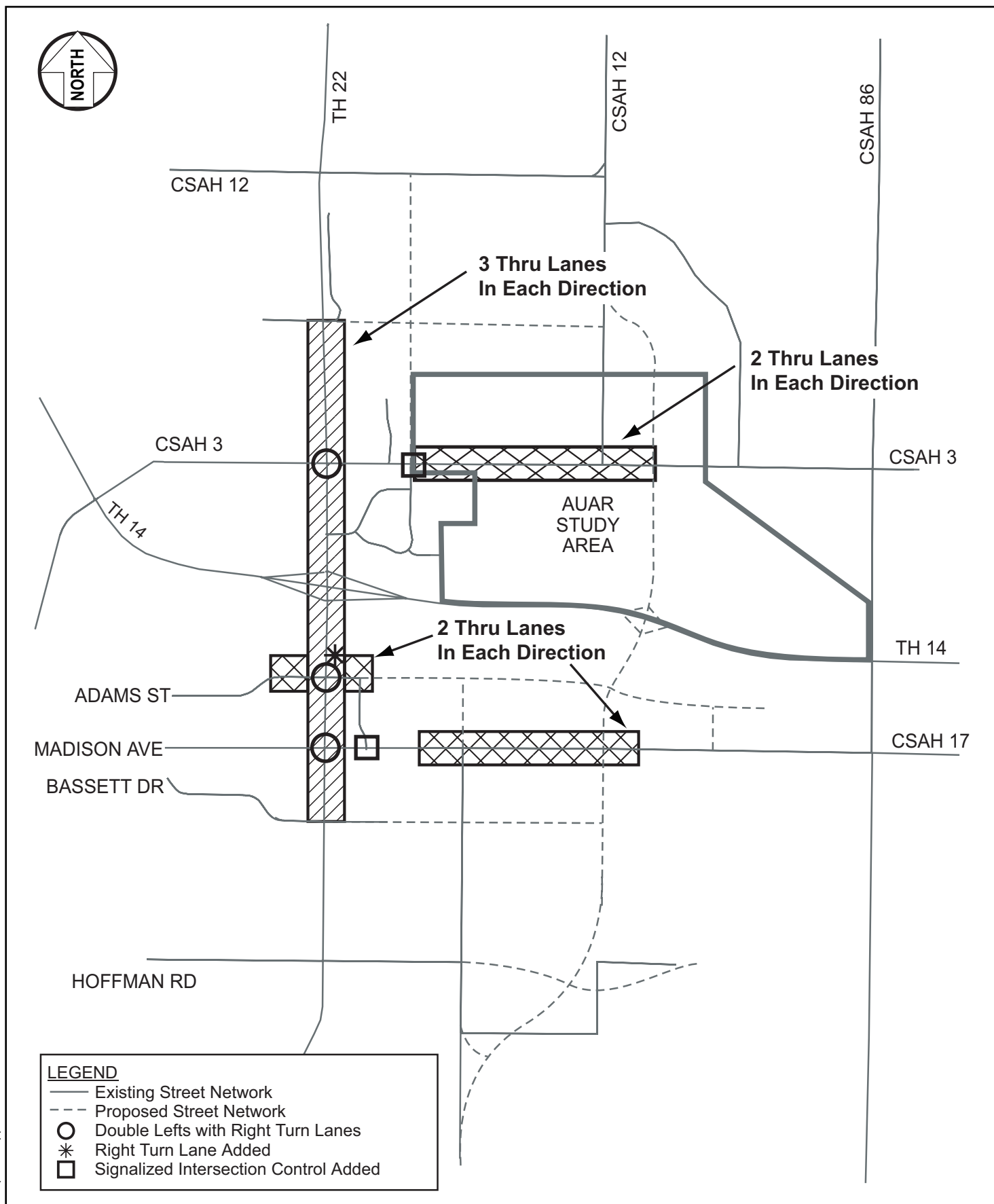


Table B.7 shows that, like the No AUAR development scenario, the TH 22 and CSAH 3, TH 22 and Adams Street, and TH 22 and Madison Avenue intersections operate below LOS D. In Scenario A, all other intersections operated at LOS D or better. Comparing operations between the No AUAR development and AUAR development Scenario A, results show the following changes in operations:

- TH 22 and TH 14 North Ramps, CSAH 12 and CSAH 3, CR 86 and Madison Avenue – fell from LOS B to LOS C
- CSAH 12 and Madison Avenue - fell from LOS C to LOS D.

Doing the same comparison for No AUAR and Scenario B, operations at the following intersections changed:

- TH 22 and TH 14 North Ramps, TH 22 and TH 14 South Ramps, CSAH 12 and CSAH 3 – fell from LOS B to LOS C
- CR 86 and Madison Avenue – fell from LOS B to LOS D
- CSAH 12 and Madison Avenue – fell from LOS C to LOS E ⁽⁴⁾

⁽⁴⁾ The level of service is affected by the large number of southbound to westbound right turns. In practice, many of the right turns may change to through moves as CSAH 12 is connected to TH 22 south of Madison Avenue. This change would improve the intersection operation, likely to LOS D.



MEMORANDUM

TO: Doug Losee, I&S Engineers & Architects, Inc.

FROM: Jonathan Ehrlich, Senior Analyst
Jianping Pei, Engineer

DATE: May 27, 2005

SUBJECT: NORTHEAST MANKATO AUAR AIR QUALITY ANALYSIS

Carbon monoxide (CO) is the traffic-related pollutant that is most likely to be a concern in Minnesota. Concentrations of CO are generally highest at intersections with poor levels of service and, consequently, more idling vehicles. The MPCA has established state standards (or maximum permissible concentrations) for CO of 30 parts per million (ppm) for a 1-hour period (average concentration), and 9 ppm for an 8-hour period (average concentration). The MPCA 1-hour standard is more stringent than the federal standard of 35 ppm.

The effects of the proposed development on air quality were examined through analysis of CO concentrations after construction near two selected worst-case intersections. The analysis was performed using forecast traffic volumes, proposed intersection geometrics, and optimized signal timing. Two computer models: the U.S. EPA MOBILE6.2 emissions model and the U.S. EPA CAL3QHC dispersion model were used to predict future concentrations at designated locations.

The emission and dispersion modeling included the following assumptions:

Analysis Years	2009 and 2025
<u>Traffic Assumptions:</u>	
Speed Class	Arterial, posted speed limits
Traffic Mix	National Default
Traffic Age Distribution	MPCA data

Meteorological and Topographic Assumptions:

Wind Speed	1 meter/second
Temperature	-8.8 degrees Celsius
Wind Direction	36 directions at 10 degree increments
Absolute Humidity:	75.0 grains/lb
Stability Class	D
8-Hour Persistence Factor	0.7
Surface Roughness	108 centimeters

Fuel Assumptions:

Fuel Program:	Conventional Gasoline East
Fuel Reid Vapor Pressure:	9.0 lbs/square inch
Oxygenated Fuels:	Ethanol with 2.7 percent oxygen content

Background Carbon Monoxide Concentrations

Background CO concentrations represent conditions without the influence of nearby vehicles. By definition, the background CO concentration in any particular area is that concentration which exists independently of direct contributions from nearby traffic. The background concentrations are added to intersection-scale modeled results to yield predicted CO levels.

In lieu of current local CO background data, MPCA default background concentrations were used. These concentrations are 3 ppm and 2 ppm for one and eight hour exposure times respectively.

For purposes of the CO analyses, the background concentrations were adjusted for region-wide increases in traffic volumes. As a worst-case assumption, no adjustment for vehicle emissions reductions was used. As recommended by the MPCA, no temperature correction factor was required as the default background concentrations are based on assumed winter conditions. The results are summarized in Table 1.

TABLE 1
CALCULATION OF CO BACKGROUND CONCENTRATIONS

Factor	2009		2025	
	1-Hour	8-Hour	1-Hour	8-Hour
Default 2005 Concentration (ppm)	3.0	2.0	3.0	2.0
Background Traffic Volume Adjustment Factor	1.13	1.13	1.81	1.81
Worst-Case Background Concentration (ppm)	3.4	2.3	5.4	3.6

Intersection Carbon Monoxide Modeling

Detailed air quality analyses were performed for the years 2009 and 2025 at two worst-case (worst level of service) intersections in the afternoon peak hour: Adams Street at TH 22 and CR 3 at TH 22.

The “sidewalk averaging” technique was used to calculate worst-case intersection CO concentrations at both intersections. Modeling “sidewalks” are located adjacent to each approach leg and departure leg at the location closest to the vehicles stopped at the traffic signal. Each sidewalk location is represented by two receptors: one receptor 10 meters from the intersection and one receptor 50 meters from the intersection. In this method, the CO concentrations from the two receptors are averaged. The worst case wind direction (of the 36 directions modeled) for each pair of sidewalk receptors was used to determine the maximum concentration for each pair of sidewalk receptors. The reported result is the maximum concentration for all of the sidewalks.

Carbon monoxide concentrations modeled for afternoon peak traffic volumes are shown in Table 2. The CO concentrations shown are the predicted maximum CO concentrations taken from the results of all modeled wind angles (0 – 360 degrees).

TABLE 2
CARBON MONOXIDE MODELING RESULTS

Intersection	Analysis Year	Modeled Concentration (ppm)		Total (Modeled and Background) Concentration (ppm)		
		1-Hour	8-Hour	1-Hour	8-Hour	Wind Direction
Adams Street at TH 22	2009	2.9	2.0	6.3	4.3	200
CR 3 at TH 22		2.4	1.7	5.8	4.0	170
Adams Street at TH 22	2025	3.1	2.2	8.5	5.8	20
CR 3 at TH 22		3.4	2.4	8.8	6.0	290

Summary of Carbon Monoxide Results

Predicted carbon monoxide concentrations adjacent to the two worst-case intersections in the project area are below federal and state standards. Because the other intersections in the project area that were not analyzed operate better in terms of total volume, delay and level of service, the analyzed intersections represent the highest expected carbon monoxide concentration in the project area.



TECHNICAL MEMORANDUM

TO: Doug Losee
Natural Resources Management Director
I&S Engineers and Architects, Inc.
1409 N. Riverfront Drive
Mankato, MN 56001

CC: Dave Montebello, P.E., Principal
Jeff Bednar, Senior Traffic Engineering Specialist

FROM: Brett Danner, Environmental Planner

DATE: June 3, 2005

SUBJECT: CITY OF MANKATO
NORTHEAST INDUSTRIAL SERVICE AREA
TRAFFIC NOISE ANALYSIS

This technical memorandum was prepared to document the methods and results of an assessment of future (2009 and 2025) noise that would be generated by vehicles Trunk Highway (TH) 22, U.S. Highway (USH) 14, and County-State Aid Highways (CSAH) surrounding the proposed City of Mankato Northeast Industrial Service Area. Existing (2002) noise levels, year 2009 and 2025 No-Build noise levels, and year 2009 and 2025 Build noise levels were analyzed. The information in this technical memorandum will be provided in an alternative urban areawide review (AUAR) for the Northeast Industrial Service Area.

Background

Following project construction, the potential sources of noise from the proposed industrial service area are limited to traffic noise. Traffic is regulated in Minnesota by the Minnesota Pollution Control Agency (MPCA) under Minnesota Statute 116.07 Subdivisions (Subd.) 2 and 4.

The proposed project is located in a rural setting adjacent to the developed setting of the City of Mankato. Adjacent land uses consist of rural/agricultural, commercial, and industrial uses. East

of TH 22 is residential land uses. High volume roads adjacent to the proposed project include USH 22 and TH 22. Vehicle traffic is the major source of noise in the project area.

Future roads include the construction of a new four-lane County State Aid Highway (CSAH) 12 connection from CSAH 3 through the AUAR industrial service area to USH 14. Included in this connection is a new full-access interchange with USH 14. This future road was considered in the noise analysis for the year 2025 with (Build) and without (No Build condition) completion of the project.

A noise analysis was completed to assess existing noise levels in the project area and to determine what effect the proposed project would have on future noise levels. The analysis consisted of monitoring existing noise levels and predicting future noise levels using computer modeling.

Noise is defined as any unwanted sound. Sound travels in a wave motion and produces a sound pressure level. This sound pressure level is commonly measured in decibels. Decibels represent the logarithmic measure of sound energy relative to a reference energy level. For highway traffic noise, an adjustment, or weighting, of the high- and low-pitched sounds is made to approximate the way that an average person hears sounds. The adjusted sound levels are stated in units of "A-weighted decibels" (dBA). A sound increase of three dBA is barely perceptible to the human ear, a five dB increase is clearly noticeable, and a 10 dBA increase is heard twice as loud. For example, if the sound energy is doubled (e.g. the amount of traffic doubles), there is a three dBA increase in noise, which is just barely noticeable to most people. On the other hand, if the source of the sound increases to where there is 10 times the sound energy level over a reference level, then there is a 10 dBA increase and it is heard as twice as loud.

In Minnesota, traffic noise impacts are evaluated by measuring and/or modeling the traffic noise levels that are exceeded 10 percent and 50 percent of the time during the hour of the day and/or night that has the heaviest traffic. These numbers are identified as the L_{10} and L_{50} levels. The L_{10} value is compared to Federal Highway Administration (FHWA) noise abatement criteria.

The following chart provides a rough comparison of the noise levels of some common noise sources:

Sound Pressure Level (dBA)	Noise Source
140-----	Jet Engine (at 75 feet)
130-----	Jet Aircraft (at 300 feet)
120-----	Rock and Roll Concert
110-----	Pneumatic Chipper
100-----	Jointer/Planer
90 -----	Chainsaw
80 -----	Heavy Truck Traffic
70 -----	Business Office
60 -----	Conversational Speech
50 -----	Library
40 -----	Bedroom
30 -----	Secluded Woods
20 -----	Whisper

Source: "A Guide to Noise Control in Minnesota," Minnesota Pollution Control Agency, <http://www.pca.state.mn.us/programs/pubs/noise.pdf> and "Highway Traffic Noise," FHWA, <http://www.fhwa.dot.gov/environment/htnoise.htm>.

Along with the volume of traffic and other factors (i.e., topography of the area and vehicle speed) that contribute to the loudness of traffic noise, the distance of a receptor from a sound's source is also an important factor. Sound levels decrease as distance from a source increases. The following rule of thumb regarding sound decreases due to distance is commonly used: "Beyond approximately 50 feet, each time the distance between a line source (such as a road) and a receptor is doubled, sound levels decrease by three decibels over hard ground, such as pavement or water, and by four and one half decibels over vegetated areas."

Minnesota State noise standards have been established specifically for daytime and nighttime periods. For residential land uses (Noise Area Classification 1 or NAC-1), the Minnesota State standards for L_{10} are 65 decibels for daytime and 55 decibels for nighttime; the standards for L_{50} are 60 decibels for daytime and 50 decibels for nighttime. The Minnesota nighttime standard is applied over the period from 10 P.M. to 7 A.M., which includes the peak morning traffic period from 6 A.M. to 7 A.M. State noise standards are depicted in Table 1.

County, township, and city roads without access control outside of the cities of Minneapolis and St. Paul are exempt from the state noise standards, per Minnesota statutes Section 116.07 Subd. 2a. Therefore, all county, township, and city roads within the project area are exempt from state noise standards. TH 22 and USH 14 are regulated under state noise standards. Minnesota state noise standards are shown in Table 1; the standards are presented for comparison purposes only.

TABLE 1
MINNESOTA STATE NOISE STANDARDS

MPCA State Noise Standards					
Land Use	Code	Day (7 a.m. – 10 p.m.) dBA		Night (10 p.m. – 7 a.m.) dBA	
Residential	NAC-1	L ₁₀ of 65	L ₅₀ of 60	L ₁₀ of 55	L ₅₀ of 50
Commercial	NAC-2	L ₁₀ of 70	L ₅₀ of 65	L ₁₀ of 70	L ₅₀ of 65
Industrial	NAC-3	L ₁₀ of 80	L ₅₀ of 75	L ₁₀ of 80	L ₅₀ of 75

Because federal funds may be used for the construction of the CSAH 12 extension and interchange with USH 14, federal noise criteria would apply when considering thresholds for consideration of noise abatement measures. This road and interchange was considered as part of the year 2025 noise analysis. For residential uses (Federal Land Use Category B), the Federal L₁₀ standard is 70 dBA for both daytime and nighttime. Locations where noise levels are “approaching” (defined as being within one decibel of the criterion threshold, i.e., 69 dBA) or exceeding the criterion level, must be evaluated for noise abatement reasonableness. Federal Noise Abatement Criteria (NAC) is shown in Table 2; the standards are presented for comparison purposes only.

TABLE 2
FEDERAL NOISE ABATEMENT CRITERIA

FHWA Noise Abatement Criteria		
Category	L₁₀ dBA	Land Use
A	60	Special areas requiring serenity
B	70	Residential and recreational areas
C	75	Commercial and industrial areas
D	NA	Undeveloped areas
E	55*	Residential, hospitals, libraries, etc.

* Applies to interior noise levels. All other land uses are exterior levels.

In addition to the identified noise criteria, the Federal Highway Administration (FHWA) also defines a noise impact as a “substantial increase” in the future noise levels over the existing noise levels. The Minnesota Department of Transportation (Mn/DOT) considers an increase of five dBA or greater a substantial noise level increase.

Noise Level Monitoring

Noise level monitoring is commonly performed during a noise study to document existing noise levels. Existing noise levels can be used as a “baseline” against which future scenarios are compared. In addition, when studying future noise levels projected by computer models, monitored noise levels for existing conditions are compared to modeled results for existing conditions to validate the computer modeling techniques and results.

Existing noise levels were monitored at one site in the project area, chosen to represent areas of outdoor human activity, i.e., residential yards (Receptor 2 shown in Figure 1). Noise levels were monitored on June 2, 2005 (nighttime peak hour, 6:00 a.m. to 7:00 a.m.). Monitoring methods used in this study comply with state and federal guidelines. A trained noise monitoring technician was present for the entire monitoring session to ensure correct operation of the instrumentation.

Traffic counts were obtained while monitoring traffic noise levels. The existing model was adjusted to match the traffic volumes and traffic mix (percentage of cars, medium trucks, heavy trucks) observed during monitoring, and to account for some shielding by buildings at the monitored receptor location. The monitored L_{10} noise levels ($L_{10}=67$ dBA) during the nighttime peak period are within 3 decibels of the modeled L_{10} levels ($L_{10}=70$ dBA), thereby validating the model.

Noise Level Modeling

Identification of Residential Receptors

The proposed project will replace agricultural land use with industrial and commercial uses. The proposed project does not include any residential uses. However, there are existing residential receptors surrounding the project area. Residential areas are considered to be more sensitive to potential traffic noise impacts than commercial and industrial land uses and have a lower state noise standard; therefore nine noise modeling receptors were selected to represent existing residential sites surrounding the AUAR project area. A hotel is located at the northeast quadrant of the TH 22/USH 14 interchange. Hotels are also considered to be more sensitive than commercial and industrial land uses; therefore this site was identified as an additional receptor location.

Receptor locations are shown on Figure 1. All receptor sites are classified within the definition of State of Minnesota NAC-1 and Federal Land Use Category B (see Tables 1 and 2).

Prediction of Future Noise Levels

Traffic noise impacts were assessed by modeling noise levels at receptor sites (i.e., residences) likely to be most affected by changes in roadway alignment and traffic volumes resulting from construction of the proposed project.

Noise modeling was done using the noise prediction program “MINNOISE”, a version of the FHWA “STAMINA” model adapted by Mn/DOT. This model uses vehicle numbers, speed, class of vehicle, and the typical characteristics of the roadway being analyzed. Posted speed limits were used to model all roads.

Noise levels were modeled for both the L_{10} and L_{50} levels for daytime and nighttime peak traffic hours. Forecast year 2009 and year 2025 peak hour traffic volumes, under land use scenario B⁽¹⁾, which are representative of the worst-case traffic volume levels and, subsequently, the worst-case noise levels, were used to model future noise levels.

The traffic mix data (percent of trucks) used in the noise modeling was 3 percent medium trucks and 14 percent heavy trucks for the daytime peak hour analysis. For the nighttime peak hour analysis, the traffic mix data (percent of trucks) used was 2 percent medium trucks and 6 percent heavy trucks. This truck percent was based on vehicle class data taken in 1992 for the TH 14 (Mankato to Smiths Mill) Final Environmental Impact Statement (FEIS) (1993, Mn/DOT and FHWA). This truck percentage was assumed for the model based on the future land uses anticipated for the industrial service area and as a worst-case scenario of future truck volumes traveling to and from the study area.

Noise Level Modeling Results

Noise monitoring and modeling results for existing residential receptors for existing (year 2002) conditions and for year 2009 are presented in Tables 3 and 4. Both daytime and nighttime L_{10} and L_{50} noise levels are shown. Year 2009 noise levels are shown under the No-Build condition and with implementation of the proposed project.

Noise modeling results for existing residential receptors for existing (year 2002) conditions and year 2025 conditions are presented in Tables 5 and 6. Both daytime and nighttime L_{10} and L_{50} noise levels are shown. Year 2025 noise levels are shown for the No-Build condition and with implementation of the proposed project and the planned CSAH 12/USH 14 interchange.

Existing L_{10} traffic noise levels surrounding the project area are above state daytime (and nighttime) standards. Existing L_{10} noise levels are discernibly higher than state standards at receptor locations (R1, R2, R8, R10) adjacent to high volume/high speed roadways in the project area (e.g., USH 14; TH 22). These traffic noise levels are also a result of high volume of high speed, heavy truck traffic on area roadways.

⁽¹⁾ The traffic volumes used in the noise analysis were taken from the traffic study results based on the more aggressive land use assumptions (see Appendix B of the June 14, 2005 memorandum *Northeast Mankato Alternative Urban Areawide Review (AUAR) Traffic Study*).

TABLE 3
NOISE MODELING RESULTS – DAYTIME (YEAR 2009)

Receptor ⁽¹⁾	Existing (2002)		2009 No Build		Difference Between Existing (2002) and 2009 No Build		2009 Build ⁽¹⁾		Difference Between Existing (2002) and 2009 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (2)	77	69	79	72	2	3	79	72	2	3
R2 (2)	77	70	79	72	2	2	79	72	2	3
R3 (1)	64	57	67	60	3	3	67	61	3	4
R4 (3)	66	54	73	63	7	9	74	64	8	10
R5 (1)	55	52	57	54	2	2	58	55	3	3
R6 (2)	68	57	73	64	5	7	74	66	6	9
R7 (1)	72	63	74	66	2	3	75	68	3	5
R8 (1)	74	69	76	71	2	2	76	72	2	2
R9 (4)	63	59	65	61	2	2	65	61	2	2
R10 (1)	76	66	78	69	2	3	78	69	2	3
State Standards	65	60	65	60			65	60		
Federal Criteria	70	--	70	--			70	--		

Bold numbers are above state standards.

⁽¹⁾ Traffic volumes taken from the traffic study results based on the more aggressive land use assumptions (see Appendix B of the June 14, 2005 memorandum Northeast Mankato Alternative Urban Areawide Review (AUAR) Traffic Study).

TABLE 4
NOISE MODELING RESULTS – NIGHTTIME (YEAR 2009)

Receptor ⁽¹⁾	Existing (2002)		2009 No Build		Difference Between Existing (2002) and 2009 No Build		2009 Build ⁽¹⁾		Difference Between Existing (2002) and 2009 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (2)	72	63	75	66	3	3	75	66	3	3
R2 (2)	73	64	75	66	2	2	75	66	2	2
R3 (1)	60	51	63	55	3	4	63	55	3	4
R4 (3)	61	48	68	57	7	9	69	58	8	10
R5 (1)	51	47	53	49	2	2	54	50	3	3
R6 (2)	63	52	68	58	5	6	70	60	7	8
R7 (1)	67	57	69	60	2	3	71	62	4	5
R8 (1)	70	64	72	66	2	2	72	66	2	2
R9 (4)	59	54	61	56	2	2	61	56	2	2
R10 (1)	71	61	73	63	2	2	73	63	2	2
State Standards	55	50	55	50			55	50		
Federal Criteria	70	--	70	--			70	--		

Bold numbers are above state standards.

⁽¹⁾ Traffic volumes taken from the traffic study results based on the more aggressive land use assumptions (see Appendix B of the June 14, 2005 memorandum Northeast Mankato Alternative Urban Areawide Review (AUAR) Traffic Study).

TABLE 5
NOISE MODELING RESULTS – DAYTIME (YEAR 2025)

Receptor*	Existing (2002)		2025 No Build		Difference Between Existing (2002) and 2025 No Build		2025 Build ⁽¹⁾		Difference Between Existing (2002) and 2025 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (2)	77	69	80	73	3	4	80	74	3	5
R2 (2)	77	70	81	74	4	4	81	75	4	5
R3 (1)	64	57	69	63	5	6	69	64	5	7
R4 (3)	66	54	76	66	10	12	76	66	10	12
R5 (1)	55	52	60	57	5	5	62	60	7	8
R6 (2)	68	57	78	71	10	14	79	73	11	16
R7 (1)	72	63	79	73	7	10	81	76	9	13
R8 (1)	74	69	77	74	3	5	78	74	4	5
R9 (4)	63	59	67	64	4	5	67	64	4	5
R10 (1)	76	66	80	73	4	6	80	72	4	6
State Standards	65	60	65	60			65	60		
Federal Criteria	70	--	70	--			70	--		

Bold numbers are above state standards.

* - number in () in this column is the number of residences represented by receptor

⁽¹⁾ Traffic volumes taken from the traffic study results based on the more aggressive land use assumptions (see Appendix B of the June 14, 2005 memorandum Northeast Mankato Alternative Urban Areawide Review (AUAR) Traffic Study).

TABLE 6
NOISE MODELING RESULTS – NIGHTTIME (YEAR 2025)

Receptor*	Existing (2002)		2025 No Build		Difference Between Existing (2002) and 2025 No Build		2025 Build ⁽¹⁾		Difference Between Existing (2002) and 2025 Build	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀
R1 (2)	72	63	75	67	3	4	76	68	4	5
R2 (2)	73	64	76	69	3	5	77	70	4	6
R3 (1)	60	51	64	57	4	6	65	59	5	8
R4 (3)	61	48	68	56	7	8	69	58	8	10
R5 (1)	51	47	56	52	5	5	58	55	7	8
R6 (2)	63	52	73	65	10	13	75	67	12	15
R7 (1)	67	57	75	67	8	10	77	70	10	13
R8 (1)	70	64	73	69	3	5	74	69	4	5
R9 (4)	59	54	63	59	4	5	63	59	4	5
R10 (1)	71	61	76	67	5	6	75	66	4	5
State Standards	55	50	55	50			55	50		
Federal Criteria	70	--	70	--			70	--		

Bold numbers are above state standards.

* - number in () in this column is the number of residences represented by receptor

⁽¹⁾ Traffic volumes taken from the traffic study results based on the more aggressive land use assumptions (see Appendix B of the June 14, 2005 memorandum Northeast Mankato Alternative Urban Areawide Review (AUAR) Traffic Study).

Increases in traffic along project area roadways between existing conditions and year 2009 would result in both No-Build and Build daytime traffic noise being barely noticeable (2 to 3 dBA) at some receptors and discernibly higher (7 to 8 dBA) at one receptor location. Traffic volume increases would result in similar increases for both No-Build and Build nighttime traffic noise.

Increases in traffic along project area roadways between existing conditions and year 2025 would result in both No-Build and Build daytime traffic noise being noticeable (3 to 5 dBA) at some receptors and discernibly higher (7 to 10 dBA) at three receptor locations under the no-build condition. Traffic noise would be discernibly higher (7 to 11 dBA) at four receptor locations under the Build condition. Traffic volume increases would result in similar increases for both Bo-Build and Build nighttime traffic noise.

Conclusions

Traffic noise levels (daytime and nighttime) were modeled at 10 receptors surrounding the project area. The number of receptors surrounding the project area over state daytime and nighttime standards (L_{10}) is summarized in Table 7.

TABLE 7
SUMMARY OF NOISE MODELING RESULTS

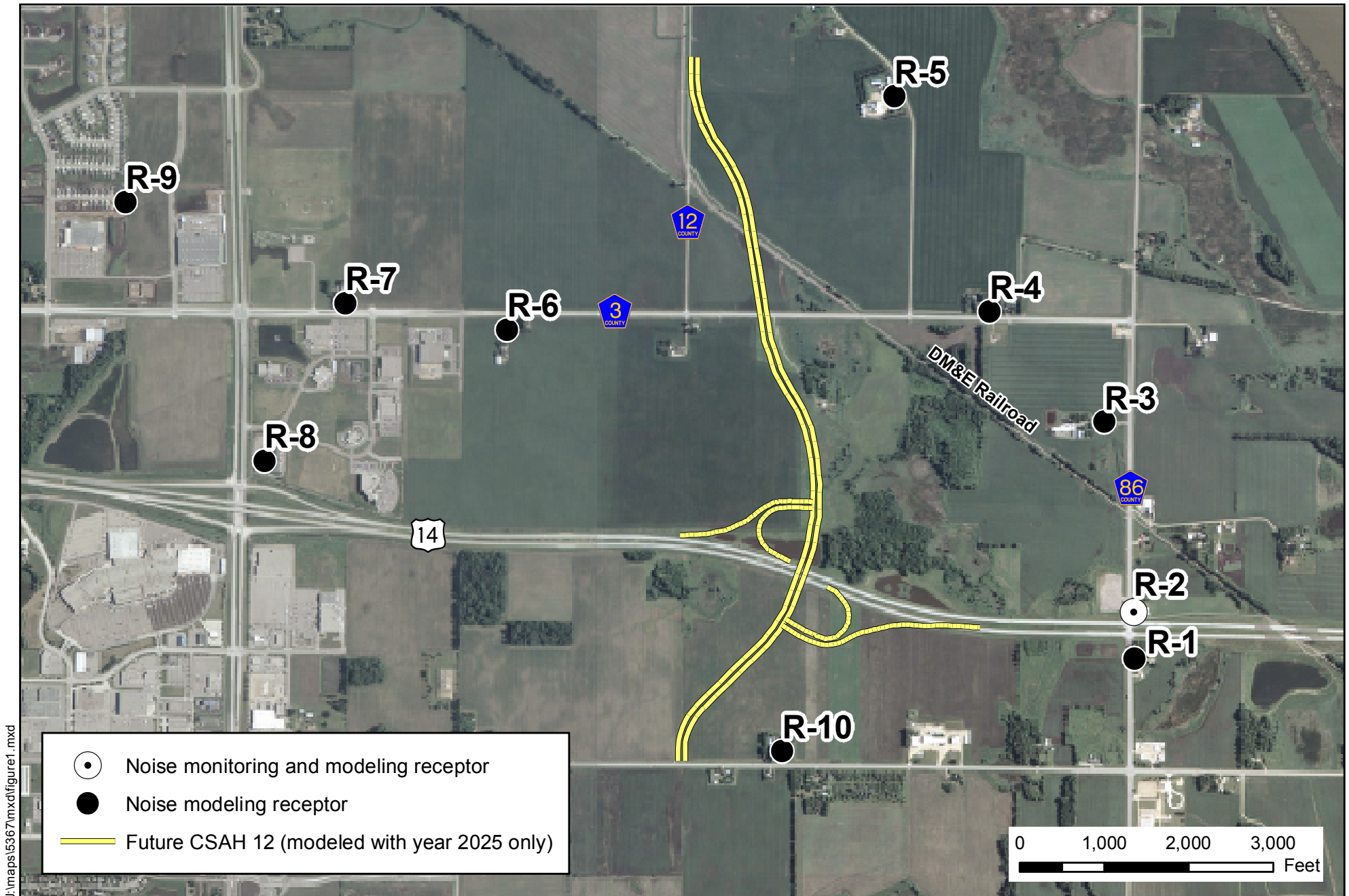
Type of Impact	Existing (2002)	Year 2009 Conditions		Year 2025 Conditions	
		No-Build	Build	No-Build	Build
Receptors Over State Daytime Standards (L_{10})	8	8	8	9	9
Receptors Over State Nighttime Standards (L_{10})	9	9	9	10	10

Existing traffic noise levels are over state standards (daytime and nighttime) surrounding the project area. Results of this analysis indicate that future noise levels (year 2009 and 2025) will exceed state standard daytime and nighttime noise levels near roadways in the project area under both the No-Build and Build scenarios. Under existing (year 2002) conditions, 8 of the 10 modeled receptors exceed state L_{10} noise standards. By year 2025, 9 of the 10 modeled receptors would exceed state L_{10} noise standards. This is not uncommon for residential receptors located adjacent to major roadways.

The difference between existing daytime L_{10} noise levels and year 2025 daytime L_{10} noise levels ranges from 3 to 5 dBA for most receptors, with three receptors experiencing increases of 7 to 10

dBA under the No-Build scenario and four receptors experiencing increases of 7 to 11 dBA under the Build scenario. This increase is due to expected traffic growth in the project area.

Receptor 6 is located within the boundaries of the proposed development area. Although this is currently a residential receptor, land uses for the proposed development area are commercial and industrial. The state NAC for these land uses are higher than for residential receptors (refer to Table 1). In years 2009 and 2025, noise levels will be above NAC-2 (commercial) state noise standards but below NAC-3 (industrial) state noise standards within the boundaries of the proposed development area. Local streets within the development are exempt from state standards and noise mitigation measures are typically not constructed within commercial areas (i.e., restricted visibility of commercial property from roadways); therefore on-street mitigation is not proposed as part of this project.





SRF No. 5366

MEMORANDUM

TO: Paul Vogel, City of Mankato

FROM: Dave Montebello, P.E., Principal
Denny Eyler, P.E., Principal

DATE: May 17, 2005

SUBJECT: TH 14/CSAH 12 Interchange Design Concepts

This short memorandum documents our thoughts and the general design criteria used to develop these concepts.

INTERCHANGE DESIGN CONCEPTS

There appear to be four basic alternatives that would fit the terrain. The four interchange concepts are:

- Alternative (Alt) 1 - Diamond (offset to south)
- Alt 2 - Fold to the west on the north side, diamond on the south
- Alt 3 - Fold to the west on the north, fold to the east on the south
- Alt 4 - Diamond on the north side, fold to the east on the south

DESIGN PARAMETERS

The basic design parameters used were based on county criteria used in the Metro area.

1. Four degree curves – This would allow for 50 mph travel without needing superelevation and having a normal crown (-0.02%). Using a 6 degree curve with (0.04% super) would also produce 50 mph for a design speed. The use of only normal crowns also means that tangent sections between reverse curves can be minimized; using superelevation may require 400 foot tangent lengths.

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Telephone (763) 475-0010 ☎ Fax (763) 475-2429 ☎ <http://www.srfconsulting.com>

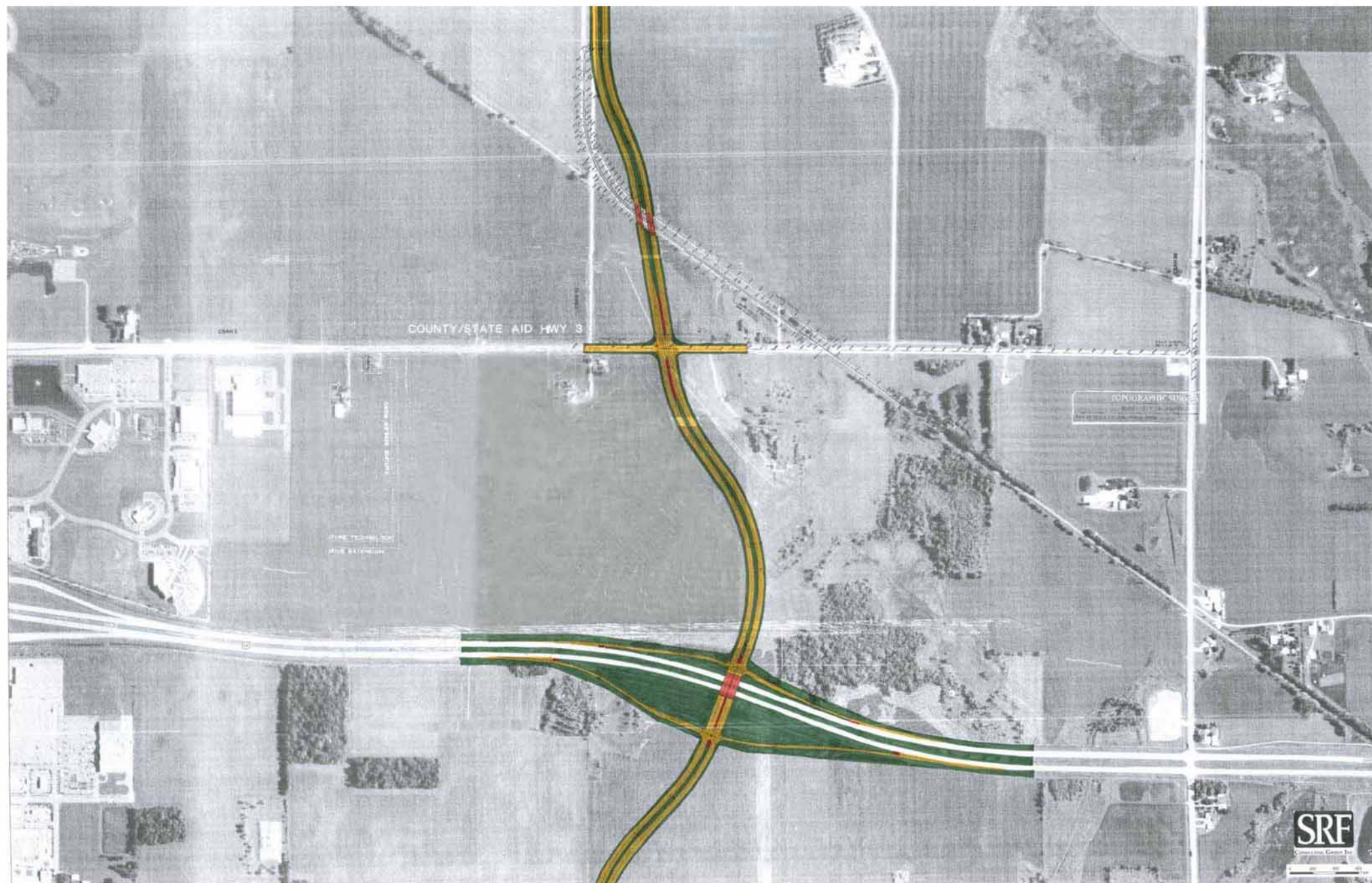
2. Four percent maximum grades on CSAH 12 – This can be maintained if the intersection at CSAH 3 is raised about 7 feet. It appears that raising this intersection higher would provide a better profile through the CSAH 3 intersection (a grade of less than 2% through the intersection). Steeper grades on CSAH 3 could be permitted because it is assumed that those approaches to CSAH 12 will be stop controlled.
3. 150 foot right-of-way – No determination of construction limits was made on these concept drawings.
4. Divided rural roadway with 58 feet between roadway centerlines - This would allow for side by side or dual left turn lanes plus a 6 foot median in the areas near intersections.
5. Turn lanes - Left and right turn lanes were assumed at each intersection.
6. Shoulders – 10 ft. on the right and 3 ft on the left when not in an intersection.
7. Exit Loop Radii - 240 feet
8. Exit Ramps/Loops Details - Ramp lengths of a minimum of 1000 feet with 300 feet of tangent at the ends for development of turn lanes. Exit ramps and loops widen to a left turn and a through lane.

OTHER CONSIDERATIONS

1. Impacts on Mn/DOT Preservation Area - The concepts were drawn at locations that were close enough to the “protected” trees that retaining walls could be required. Once into final design, more work can be done to balance construction cost, right-of-way impacts and design standards to avoid impacts on the trees and keep costs reasonable.
2. Ramp-to-Ramp Through Alignment - Ramp to ramp through alignment (for snowplows) were not always obtained by bending ramp alignments to create a tangent through alignment at 90 degrees to CSAH 12. Since 99.9 % of vehicles are turning anyway and therefore must slow down, ramp designs with straight through alignments are often more costly, consume more right-of-way, may need to be longer (thereby degrading spacing on the mainline and frequently require turn lanes to be introduced on curves. Angled ramp intersections are seldom a problem if the angle is kept small. For these ramps, the left turn paths onto CSAH 12 would be adequately defined by the location of the median noses on CSAH 12. Some ramp line up on tangents some don't.
3. Ramp Intersection Options - The interchanges with the folded ramps on the south side do offer an opportunity to provide a fourth leg at the ramp intersection to connect into the roadway network. Current Mn/DOT policy (May 14, 2005) would allow these fourth legs if they are in fact minor collector roadways or higher in classification. No

local streets, no cul-de-sacs and definitely no driveways would be allowed as fourth legs.

4. CSAH 12 Alignments - The alignment across CSAH 3 and the DM&E is at an angle to improve the distance available for raising the CSAH 3 grade and to also minimize the wasted land north of the tracks along the west side of new CSAH 12 up to the touch down point with existing CSAH 12. The intersection angle at CSAH 3 is 80 degrees, 75 degrees is typically allowed. The skew bridge over the railroad would add very little additional cost.
5. CSAH 12 Design - Given the existing and likely forecast volumes, new CSAH 12 could start out as a "Super Two". With the "Super Two" design, and if an interchange with loops is selected, then a 3 lane bridge with end to end left turn lanes could be built as the first phase. For the diamond, side-by-side left turn lanes would be called for based on standard lengths, adequate, but less than optimal end to end left turn lanes could be utilized with the design if need be.
6. Width of Bridges over DM&E - There was also no attempt to narrow the centerline spacing on the bridges over the DM&E to have a single bridge. This is certainly an item that should be reviewed in preliminary design.

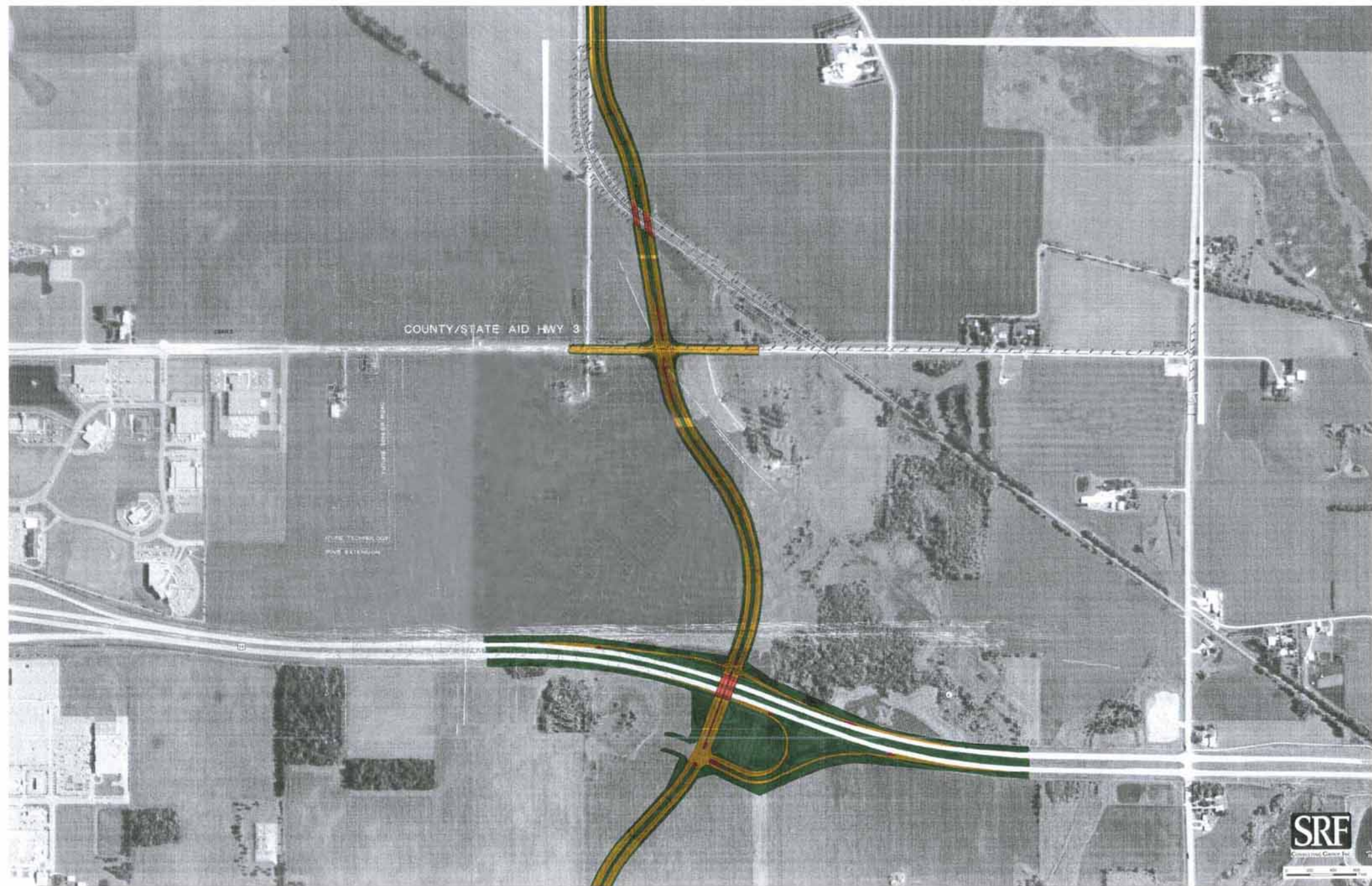






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APPENDIX F.
Natural Resources Assessment Inventory

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Date: May 31, 2005

From: I&S Engineers & Architects, Inc.

RE: AUAR Natural Resources Assessment Inventory

A natural resources assessment inventory of the project area was completed by I&S between May 17-28, 2005. The inventory consisted of field observation of the plant communities, plant species, wildlife species, and potential wetland areas within the project area.

A walk through of each cover type was conducted to identify the dominate plant species and classify the plant community. The inventory walk through pattern was random, and no specific sample transects or sample point locations were selected prior to field examination of the project area. The cover types were classified according to the plant species present, the mapped soil types represented in the Blue Earth County Soil Survey, and the hydrology observed at the time of the field inventory.

During the field inventory no special concern, threatened, or endangered plant, wildlife, or fish species were observed within the project area. The field inventory conducted by I&S can not guarantee that all special concern, threatened, and/or endanger species of plant, wildlife, or fish are absent within the project area at all times of the year.

All potential wetlands within the project area were originally identified using the National Wetland Inventory (NWI) and the Blue Earth County Soil Survey. Potential wetland were then recognized within each cover type during the field investigation. These wetlands have not been officially delineated by I&S, and an official wetland delineation in accordance with the 1987 Army Corp of Engineers Manual will be completed prior to any development of the project area.

Tree Rows

A number of tree row plantings were observed within the project area. All of the farmsteads within the project area are surrounded by tree rows. The farmstead windbreak tree row plantings are generally made up of Colorado blue spruce and white spruce with occasional scotch pine, balsam fir, and eastern red cedar. The windbreak understories contain prickly gooseberry, European buckthorn, American hazelnut, wild grape, black raspberry, stinging nettle, Kentucky bluegrass, common dandelion, and white clover. The farmsteads also have Siberian elm, American elm, green ash, Norway maple, silver maple, and apple trees planted throughout the lawn areas.

A tree row exists adjacent to the Sakatah Trail and it is unknown whether these trees were planted by the Minnesota Department of Natural Resources or if the trees exist by natural revegetation. The tree and shrub species observed along the Sakatah Trail included green ash, Siberian elm, eastern cottonwood, wild plum, crab apple, boxelder, prickly ash, swamp white oak, hackberry, sumac sp., lilac and nannyberry. The herbaceous layer under the tree row along the trail is primarily dominated by smooth brome. Some areas of the tree row include Kentucky bluegrass, Canada bluegrass, red clover, black current, cow parsnip, Queen Anne's Lace, prickly gooseberry, Indian grass, reed canary grass, golden Alexander, wild grape, equisetum sp., Solomon's seal, wild strawberry, common violet, bird's foot trefoil and a species of rose.

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A tree row planting also exists adjacent to the large excavated wetlands along the southern Project boundary adjacent to TH-22. The shrubs present in the planted rows are tatarian honeysuckle.

Mesic and Dry Introduced Short Grasses and Legumes

Areas of maintained vegetation exist in portions of the Project area mainly in the location of the existing buildings, public road right-of-ways, and on a small portion of Sub-district E. The dry areas throughout this location are dominated by Canada bluegrass, Kentucky bluegrass, common dandelion, yellow foxtail, and squirrel tail. The moist soils are dominated by redtop, yellow foxtail, Canada goldenrod, and path rush. Also present in this area is purslane speedwell, reed canary grass, Canada thistle, and sow thistle.

A second introduced grass and legume area exists in the middle of section G. The area is primarily dominated by red clover in the moist soils, and alfalfa on the hills and drier soils. Giant foxtail, Canada thistle, Canada goldenrod, reed canary grass and wild strawberry are present throughout the short grass seeding. Wild plum and reed canary grass are prominent along the northeast edge of the short grass area.

Mesic Mixed Deciduous Woodland

Section G contains two woodland areas, which will be referred to as the east and west woodland areas respectively. The east woodland is a mesic mixed deciduous woodland with scrub-shrub and wetland areas within the woodland boundaries. The area is dominated by green ash with eastern cottonwood, American elm, silver maple, and basswood present. The forested wetlands within this area are dominated by American elm, green ash, and boxelder. There is also a forested/scrub-shrub wetland which is dominated by green ash, black willow, red-osier dogwood, reed canary grass, and dark green bulrush. The east woodland understory species consist of Virginia waterleaf, stinging nettle, Virginia creeper, common woodland violet, black current, prickly gooseberry, bedstraw, reed canary grass, Solomon's seal, black raspberry, blood root, burr cucumber, woodland anemone and downy yellow violet.

The west woodland in section G is a mesic mixed deciduous woodland with scattered eastern red cedars, and is dominated by boxelder and European buckthorn. Other tree species consist of hackberry, silver maple, and basswood. The herbaceous layer is comprised of smooth brome, reed canary grass, burdock, and young European buckthorn.

Section I contains one large, mesic mixed deciduous woodland, which has scattered forested wetlands throughout. The forested wetlands were dominated by green ash, silver maple, black willow, eastern cottonwood, and reed canary grass. The upland areas consist of tree species including American basswood, rock elm, green ash, and eastern red cedar. The shrub species included European buckthorn, red-osier dogwood, nannyberry, and prickly ash. The understory herbaceous layer consisted of black current, Virginia creeper, Virginia waterleaf, trillium sp., Jack in the pulpit, common violet, bed straw, and downy yellow violet. This area is dominated by green ash and European buckthorn, and the understory shows poor signs of hardwood sapling regeneration. There were some large American basswoods present along the southern edge of the woodland.

Section H has a small mesic mixed deciduous woodland with a forested/scrub-shrub wetland present within the woodland. Tree species include silver maple, green ash, boxelder, American basswood,

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and hackberry. The shrub layer is primarily European buckthorn, tatarian honeysuckle, red-osier dogwood, and prickly ash. The herbaceous layer is comprised of Virginia waterleaf, reed canary grass, black current, and Virginia creeper. The wetland area was dominated by reed canary grass, red-osier dogwood, and boxelder.

Mesic Scrub-Shrubland

There are two mesic scrub-shrubland areas within section G adjacent to the east woodland. These areas are dominated by reed canary grass, red-osier and grey dogwood, green ash, and eastern cottonwood. Prickly gooseberry, common dandelion, Kentucky bluegrass, sandbar willow, eastern red cedar, American elm, Siberian elm, wild strawberry, Virginia waterleaf, and various sedge species are also present within this plant community. Small scrub-shrub wetlands exist within the mesic scrub-shrubland area. The wetland areas are dominated by reed canary grass, red-osier dogwood, eastern cottonwood, and green ash saplings. There is also a mature stand of American basswoods to the southeast.

A small area is also present between the excavated wetlands in section I. The area is dominated by reed canary grass, European buckthorn, goldenrod, and green ash saplings. Kentucky bluegrass, big bluestem, common dandelion, and prickly gooseberry are also present in this area.

Emergent and Scrub-Shrub Wetland

Section C has an emergent/scrub-shrub wetland, which is dominated by reed canary grass, red-osier dogwood, and black willow.

Section G has an emergent wetland with scattered trees and shrubs on the north end. This area is dominated by reed canary grass with scattered black willow and red-osier dogwood. Also present in this area is broad-leaf cattail and a *Scirpus sp.* This area of section G also has mesic tall grassland, which is dominated by reed canary grass with some small patches of boxelder. A drainage ditch runs from north to southeast through this area.

There is an emergent/scrub-shrub wetland with mesic grassland located in the southern part of section G. This area is dominated by reed canary grass. Red-osier dogwood, green ash, black willow, European buckthorn, and stinging nettle are located within this area. In ponded water areas yellow water buttercup are present. A drainage ditch is also present within this area.

Section I has a large emergent wetland with scattered shrubs present along the northeast edge of the section. The wetland area is dominated by narrow-leaved cattail, reed canary grass, and giant reed grass. Other herbaceous species include stinging nettle, black current, giant goldenrod, and a species of equisetum. Shrub species include red-osier dogwood, sandbar willow, and eastern cottonwood. A small portion of this wetland is a sedge meadow, and is dominated by *Carex stricta*.

Section I contains a scrub-shrub wetland with scattered emergent wetland areas and scattered mesic scrub-shrubland. The wetland areas are dominated by reed canary grass, green ash, red-osier dogwood, sandbar willow, and broad and narrow-leaf cattails. Also present in this area are blue flag iris, dark green bulrush, bedstraw, giant goldenrod, prairie cord grass, Canada bluegrass, and various sedge species. There are also areas of planted eastern cottonwood.

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Native and Introduced Grassland with Scattered Shrubs

Section I has an area along the east edge that has been seeded to a mixture of native and introduced grasses, forbs, and shrubs planted by the Minnesota Department of Transportation. The grassland species present include big bluestem, switchgrass, Canada goldenrod, greyheaded coneflower, purple coneflower, smooth brome, Canada bluegrass, blue flag iris, wild bergamot, Kentucky bluegrass, Canada wild rye, sweet clover, and golden Alexander. The shrub and tree species present include sandbar willow, red-osier dogwood, amur maple, *Viburnum* sp., and red oak.

Saturated and Mesic Grassland

Section H contains an area that is saturated and mesic grassland, dominated primarily by reed canary grass. This area also contains potential emergent wetlands. The wetter areas have narrow-leaf cattail, dark green bulrush, and path rush. Drier areas are occupied by Kentucky bluegrass, common dandelion, and stinging nettle. Scattered eastern cottonwood, boxelder, black willow and red-osier dogwood were also present throughout the grassland area.

Section G has a saturated and mesic grassland area with potential wetlands scattered throughout. The grassland in the northeast portion of section G has reed canary grass, redtop, Canada wild rye, common dandelion, and pennycress. There is dark green bulrush present in some of the wetter areas. An old ditch bed is present within this portion of the grassland area. This grassland area extends along the west edge of section G to the southern edge. The southern large portion of the grassland area contains reed canary grass, Kentucky bluegrass, perennial rye grass, common dandelion, Canada thistle, penny cress, common ragweed, wild strawberry, giant ragweed, goldenrod, smooth brome, and various sedge species.

Excavated Wetlands

Two excavated wetland areas exist along the southern edge of section I. These excavated wetlands are part of MnDOT's wetland mitigation area and were created as part of TH-22 reconstruction. Both wetlands have significant open water, and are surrounded by broadleaf cattails, sandbar willow, giant reed grass, and hardstem bulrush. The wetland areas are surrounded by upland buffer areas that have been seeded with mixed grasses and planted with shrubs and trees. The upland areas included Indian grass, big bluestem, little bluestem, smooth brome, Kentucky bluegrass, switchgrass, common dandelion, black raspberry, nannyberry, silver maple, and eastern cottonwood. Planted rows of tatarian honeysuckle are also present, and European buckthorn has become established along the upland fringe.

State Trail and Railroad Track Area

The Sakatah Trail area and DM&E railroad track right-of-ways have been seeded with a mix of native and introduced grass and forb species. Trees and shrubs present in these areas appear to have been planted. The herbaceous species present include Kentucky and Canada bluegrass, smooth brome, reed canary grass, Indian grass, common dandelion, common violet, golden Alexander, blue-eyed grass, wild strawberry, birdsfoot trefoil, Solomon's seal, bedstraw, goldenrod, cow parsnip, red clover, multiflora rose, wild grape, prickly gooseberry, and stinging nettle. The tree and shrub species include boxelder, wild plum, Siberian elm, green ash, eastern cottonwood, sumac, nannyberry, wild plum, crab apple, eastern red cedar, swamp white oak, and prickly ash.

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There are potential wetland areas within the railroad right of way, and a possible wetland in section D extending from the trail north into the agriculture field.

Planted and Maintained Lawn Seedings

Five farmstead areas existed within the Project area. All of the farmsteads have lawn areas, which are dominated by Kentucky bluegrass, white clover, and common dandelion. Ornamental trees, shrubs and forbs were also observed in some of these areas. Several of these farmsteads have tree row plantings that were discussed earlier in the cover type section of this report.

APPENDIX G.
Comments Received During 30-day Comment Period



MINNESOTA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ECOLOGICAL SERVICES
500 LAFAYETTE ROAD, BOX 25
SAINT PAUL, MN 55155
651-296-2835
FAX - 651-297-1500

FACSIMILE TRANSMITTAL SHEET

TO: PAUL VOGEL Community Development Director	FROM: MATT LANGAN, ENVIRONMENTAL PLANNER MNDNR
COMPANY: CITY OF MANKATO	DATE: 08-03-05
FAX NUMBER: 507-387-6845	TOTAL NUMBER OF PAGES INCLUDING COVER: 5
PHONE NUMBER: 507-387-8613	SENDER'S PHONE NUMBER: 651-297-3359
RE: NORTH PA ST INDUSTRIAL AREA DRAFT AUAR	

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Minnesota Department of Natural Resources comment letter regarding the North ~~PA~~st Industrial Area Draft AUAR.. Signed copy to follow via U.S. mail. Please feel free to contact me with any questions.

Thanks, Matt

CONFIDENTIALITY NOTICE

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Minnesota Department of Natural Resources

500 Lafayette Road
St. Paul, Minnesota 55155-40²⁵

August 3, 2005

Mr. Paul Vogel
Community Development Director
City of Mankato
P.O. Box 3368
Mankato, MN 56002-3368

**RE: Northeast Industrial Service Area
Draft Alternative Urban Areawide Review**

Dear Mr. Vogel:

The Department of Natural Resources (DNR) has reviewed the Northeast Industrial Service Area Draft Alternative Urban Areawide Review (AUAR). We offer the following comments for your consideration.

General comments

In reviewing the AUAR, DNR's primary concern is the capability of Subsection G to be developed. DNR recommends that the City consider designating Subsection G for open space use instead of Subsection D. At a minimum, the City should require a formal wetland delineation of Subsection G before proceeding with development of a final AUAR, so that the delineation can inform decision-making.

In cross-referencing Item 10 (Cover Types, pages 11-15) with Exhibit G, it is apparent that the majority of the west edge of Subsection G is wetland. Going to the east side of this subsection, the text indicates that the mesic scrub/ shrubland is dominated by hydrophytic vegetation (reed canary grass, red-osier dogwood, gray dogwood, green ash, sandbar willow, and sedges), and Exhibit I indicates this area contains hydric soils as well; therefore much of this area is likely jurisdictional wetland. The text for the mixed mesic deciduous woodland also indicates there is wetland interspersed there, and the text describes a relatively good quality native woodland. Therefore, with the wetlands intermixed in these two habitats, it seems the eastern part of Subsection G will be difficult to develop as well. This leaves only the degraded western woodland area and the central "mesic and dry introduced short grass and legumes" area available for development. However, even the descriptor for the short grass and legume area indicates moist soil conditions and a prevalence of reed canary grass, and Exhibit I shows hydric soils there, so even much of that area has the potential to be wetland and undevelopable, especially if 16.5 foot buffers are also incorporated around the wetlands. Add to this Exhibit E₂ which shows the Alliance and Dome Pipelines crossing this parcel, and Exhibit M showing this area to be outside of the sanitary sewer service boundary, it seems much more appropriate that this area should be set aside as open space, instead of Subsection D. Page 20 of the AUAR indicates that wetland replacement for any project impacts could include "construction of wetlands in an upland area of the Project," and indeed Wetlands Conservation Act (WCA) requires this before replacement through an off-site wetland bank can be authorized. Therefore, consideration could be given to creating a project-specific wetland bank within Subsection G.

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Specific Comments

Fish and Wildlife and Ecologically Sensitive Resources (Item 11a, pages 15-18).

The larger and higher quality woodlands and scrub-shrublands within the AUAR area, that are not dominated by exotic species, are likely to support a diverse array of breeding neotropical migrants, a category of birds in which many populations are in decline. Conversely, the native grasslands (but not the grasslands dominated by brome or reed canary grass) are likely to support a variety of grassland birds such as meadowlarks, sedge wrens, and field sparrows. Many grassland birds are also experiencing sharp population declines. This is another reason the DNR recommends preserving Subsection G as open space rather than Subsection D.

The AUAR describes the City's intent to preserve a large emergent wetland in Subsection I. While DNR supports this intention, the AUAR text does not include a discussion of the protections afforded wetlands by WCA sequencing provisions. Before any wetlands can be impacted, every effort must be made to avoid the wetland impact. If avoidance is not possible, the wetland impact must be minimized to the maximum extent practicable. Only after avoidance and minimization have been addressed is replacement of impacts allowed. The City should consider the sequencing requirements of WCA as it decides how reasonable development of the project area should proceed. Again, DNR is primarily concerned about the feasibility of developing Subsection G, and Subsection C as well.

The AUAR also describes the potential for wildlife displacement. A common misconception is that wildlife will relocate to other areas as the AUAR suggests. Habitat is usually saturated (i.e., at carrying capacity) for most wildlife species if populations are in balance. In fact, it is more likely that wildlife impacts will be greater than presumed as displaced animals will put stress on neighboring established animals as the displaced individuals disburse. The disbursing animals are more likely to suffer increased mortality or not become part of the breeding population than they are to find a vacant territory and reproduce.

The proposed mitigation measures for wildlife impacts are sound measures. However, the first measure, if fully implemented, would seem to make subsection G largely undevelopable. Since the AUAR proposes to develop Subsection G, DNR questions how this mitigation measure would be implemented. Again, DNR believes designating Subsection G as open space and reserving it for wetland mitigation and stormwater control would be more beneficial.

Physical Impacts on Water Resources (Item 12, pp.18-20).

The first paragraph on page 19 indicates that a Mankato city ordinance will prohibit wetland filling and dredging, and will implement a 16.5-foot buffer around existing wetlands. However, other paragraphs in this section and other sections of the AUAR imply there may be some wetland filling and replacement. This appears to be conflicting information. DNR anticipates that there will be some wetland filling and replacement, and that it will be in compliance with the sequencing principles of WCA and Section 404 of the federal Clean Water Act. The final AUAR should demonstrate how the plan will comply with sequencing requirements. One way to do so is not to develop in areas that require substantial filling of wetlands.

Mr. Vogel
August 3, 2005
Page 3

This section further reiterates that wetlands have not yet been identified based on official wetland delineations. For most Subsections, that should not be a problem. However, DNR recommends that official delineations be accomplished for at least Subsection G, if not all of the Subsections. Such delineations can only help to inform decision-making.

Consideration should be given to restoration of the degraded type-3 wetland in Subsection C for partial wetland mitigation credit.

The last paragraph on page 19 indicates there are five identified wetland basins in Subsection G, based on NW1 maps. However, based on the vegetation descriptions in Item 10, DNR believes there are more than five wetland basins in Subsection G.

The last paragraph on page 20 indicates that wetland mitigation (replacement) will be accomplished through either purchase of wetland banking credits or on-site wetland creation. The City should be aware that WCA allows off-site wetland bank replacement only if on-site replacement is not practicable. In this case, on-site replacement seems feasible. Therefore, off-site banking is unlikely to be allowed.

Draft Mitigation Plan I.A.1.a. (p.58).

Other text in the AUAR indicates there is a 16.5-foot setback from wetlands. Is this setback distance proposed to be increased or decreased? A decrease in setbacks would not be "mitigation." Some other Local Government Units in the state have setback requirements of 25, 33, or 50 feet. Increasing the setbacks would constitute "mitigation."

Draft Mitigation Plan I.A.1.b. (p.58).

Such guidelines already exist in WCA, as well as in Section 404 of the Clean Water Act (i.e., the "404(b)(1) guidelines"). The AUAR should simply assure that the proposed development of the sites complies with the existing guidelines.

Draft Mitigation Plan I.B.1.a and d. (p.59).

What is the intent of the wetland mitigation items? Please clarify.

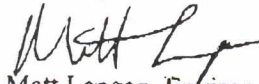
Draft Mitigation Plan I.B.1.c. (p.59).

The AUAR process should determine which Subsections can be reasonably developed with little or no wetland impact. If a Subsection cannot be developed without wetland impacts, the proposed use of the Subsection should be modified through the AUAR process, rather than deferred until later.

Mr. Vogel
August 3, 2005
Page 4

Thank you for the opportunity to review this document. We look forward to receiving your Final AUAR and Mitigation Plan at a future date. Please contact me at 651-297-3359 if you have questions regarding this letter.

Sincerely,



Matt Langan, Environmental Planner
Environmental Review Unit
Division of Ecological Services
(651) 297-3359

c: Cheryl Heide, Tom Balcom, Mike North, Todd Kolander, Leo Getsfried, Jon Larsen - EQB,
Dan P. Stinnett - USFWS.

ERDB#20050731-0002

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VIA FACSIMILE

August 3, 2005

Mr. Paul Vogel, Community Development Director
City of Mankato
P.O. Box 3368
Mankato, MN 56002-3368

RE: Comments on the Northeast Industrial Service Alternative Urban Areawide
Review (AUAR)

Dear Mr. Vogel,

The Alternative Urban Areawide Review (AUAR) for the City of Mankato Northeast Industrial Service has been reviewed by the Minnesota Pollution Control Agency (MPCA) staff. This comment letter addresses matters of concern to MPCA staff reviewing the AUAR and is submitted for consideration by the city of Mankato (City). This letter does not constitute approval by the MPCA of any or all elements of the project for the purpose of pending or future permit action(s) by the MPCA. We have attempted to identify and consult with interested program staff to identify the MPCA permits that may be required. Additional comments or requests for information may be submitted in the future to address specific issues related to the development of such permit(s). Ultimately, it is the responsibility of the project proposer to secure any required permits and to comply with any requisite permit conditions.

Table 8-1 in the draft AUAR indicates the types of permits and approvals required for the development and that an Army Corps of Engineers Section 404 permit is required for this project. Item 8 also indicates that an MPCA 401 Certification will be required. Since the MPCA is waiving 401 certifications, we recommend the following language be included in the AUAR to accurately inform any reviewers of the status of MPCA's 401 reviews and determinations:

The MPCA is limited to waiving many Section 401 certification applications with limited exceptions. Applications for 401 certification must still be sent to the MPCA as they have been in the past. In most cases, MPCA's decision will be to issue a waiver but the MPCA reserves the right and authority to proceed differently if extreme or unique circumstances merit a different approach. The waiver of 401 certification means that the MPCA has not reviewed the proposed federal permit application for conformance with state water quality standards nor has the MPCA made a determination of the proposal's compliance with water quality standards. This waiver action does not exempt the applicant from the responsibility of complying with all applicable water quality standards and requirements as contained in Minn. R. 7050 and all other applicable state rules regarding water quality. In the event of water quality violations caused by the applicant's project, enforcement action may be taken by the MPCA.

Table 8 indicates the permits and approvals that would be applied for regarding wetland filling or draining; that is to the Corps of Engineers 404 program and to the Local Unit of Government under the Wetland Conservation Act. However, item 12 indicates "There will be no dredging, filling, stream diversions, diking of any surface waters..." and then

in the mitigation discussion of item 12 it indicates that "Any wetland impacts involved with the development of the Project will be administered in accordance with the Minnesota Wetland Conservation Act and Section 404 of the Clean Water Act..." These statements appear to conflict. The expectation for wetland filling, draining, excavation or inundation should be quantified and located on the site layout in respect to proposed development in order to access the potential for environmental impact through this AUAR. Also, a reasonable proposal for compensatory wetland replacement for the proposed wetland impact should demonstrate that the anticipated impact can be mitigated for on site or however, proposed.

Item 12 of the AUAR indicates that the local ordinance requires a 16.5 foot setback for structures and impervious surfaces from the delineated edge of the wetlands. The document does not discuss any proposed protections to the wetlands such as buffers. The MPCA supports a requirement that adequate natural buffers be included surrounding the wetlands. At a minimum, these buffers should be in the 20 – 50 foot range with more buffer dependant on the protection goals. The buffer of native vegetation needs to be perpetually maintained around the wetlands and we recommend the city prohibit the alteration of the natural vegetation within the buffer strip. Conservation easements, covenants, recorded deed restriction or other permanent restriction have been used to prohibit lot owners from filling or altering wetlands and buffers on their lots, however, enforcing the buffer restriction on each of the individual lot owners can be burdensome and difficult if lot owners desire to mow these areas to expand their back yard. We recommend the wetland boundary and an appropriate buffer be designated public property under the city's management to assure the maintenance of the buffer and to avoid the difficulties of enforcing these restrictions on individual lot owners in the future.

The document does not describe if any type of impact to the wetlands may occur in response to the construction and operation of storm ponds. It should be noted that MN Rule 7050 requires the protection of all wetlands that are considered "waters of the state" as defined in Minn. Stat. 115.01 subd.22. It should be noted that wetland impacts that may be considered non jurisdictional or exempted from the CWA 404 program or WCA may still be regulated by the MPCA. For example, any existing wetlands that are altered by excavation or other construction to function as stormwater retention basins should be considered to be adversely impacted and evaluated under the sequence mitigation requirements of water quality standards in MN Rule 7050.0186 and the NPDES permit. The requirement in water quality standards to avoid, minimize and mitigate wetland impacts must be satisfied in all MPCA NPDES/SDS permits, including the issuance of the general Construction Storm Water (CSW) NPDES permits. If a project involves altering a wetland by draining, filling, excavation or inundating and that impact is not addressed (mitigated) by either the U.S. Army Corps of Engineers Section 404 program, Minnesota Department of Natural Resources, or the State of Minnesota Wetland Conservation Act permits or other determinations then the project proposer must demonstrate compliance with the mitigation requirements of MN Rule 7050.0186. For the purposes of the MPCA CSW NPDES permit, de minimus determinations by another permitting agency that address the project impacts are recognized by the MPCA and no additional mitigation is required. However, a non-jurisdiction determination by another

permitting agency does not address project impacts and therefore does require the project proposer to demonstrate mitigation to meet NDPES permit conditions and MN Rule 7050.0186.

MPCA staff note that some municipalities have designed their entire storm-sewer system using wetlands as the discharge point. Cases also exist where numerous isolated wetland basins were artificially connected via a storm-sewer network creating a "flow through" system where none existed previously. Use of wetlands for such storm-water purposes is often justified by the proposer on the basis of cost savings, convenience, or ease of construction, since many wetlands are topographic depressions. However, the exclusive exploitation of a single wetland function, such as stormwater retention, is likely to degrade the other functions of the wetland and, therefore, causes degradation of the multiple function and multiple values of the designated uses of that wetland. A local community may place more public value on a single function of a wetland such as stormwater retention, however, that single value emphasis should not distort the application of designated use to a single function to the detriment of the multiple functions that the natural wetland provides.

Another concern identified within the AUAR is the discussion of cumulative impacts found in Item #29. The MPCA has noticed that a number of governmental units coordinating and developing an AUAR do not conduct a cumulative impact assessment, relying on the first portion of the Environmental Quality Board guidance as justification for eliminating the cumulative impacts analysis:

"This item does not require a response for an AUAR since the entire AUAR process deals with cumulative impacts from related developments within the AUAR area."

The complete AUAR guidance¹ reads as follows:

"This item does not require a response for an AUAR with respect to cumulative impacts of potential developments within the AUAR boundaries, since the entire AUAR process is intended to deal with cumulative impacts from related developments *within* [Italics Added] the AUAR area; it is presumed that the responses to all items on the EAW form encompass the impacts from all anticipated developments *within* the AUAR area.

However, the questions of this item should be answered with respect to the cumulative impacts of development within the AUAR boundaries combined with past, present, and reasonably foreseeable future projects *outside* [Italics added] of the AUAR area, where such cumulative impacts may be potentially significant. (As stated on the EAW form, these cumulative impact descriptions may be provided as part of the responses to other appropriate EAW items, or in response to this item.)"

Based on MPCA staff review, the existing AUAR does not currently provide a sufficient analysis of the potential cumulative impact issue either within or outside the boundaries of the project area in light of the current EQB AUAR guidance. The cumulative impact assessment within the boundaries of the project area does not appear to be explicitly addressed within the confines of the AUAR (e.g., specifically identified as "*Cumulative Impact*" within any of the AUAR Items),

¹ Environmental Quality Board, (2004). Recommended Content and Format – Alternative Urban and Areawide Review Documents. <http://www.eqb.state.mn.us/pdf/AUARformat2a-rev%205-041.pdf> [November 23, 2004]

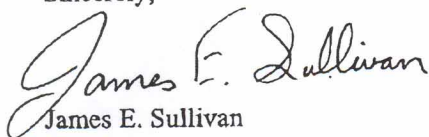
nor is a discussion of potential cumulative impacts to areas outside the boundaries of the project area. The City has recognized that there will be modifications to the future landscape as part of the project, however, little is provided in support of this discussion. The MPCA recognizes that the manner in which the cumulative impact assessment is conducted is a function of City financial and information resources. A variety of methods exist in which a cost-effective analysis could be conducted that would aid in the AUAR decision-making process. Clearly, not all environmental, social or economic media lend themselves to an effective quantitative analysis. In the absence of method or information to conduct a quantitative cumulative impact assessment, qualitative methods will suffice.

Fortunately, much of the information needed for the completion of the cumulative impact evaluation of this project is likely already in existence. Some of the analytical work already conducted for the AUAR can be used to develop the cumulative impacts analysis within the project boundaries. Either a separate analysis or an adapted analysis within the framework of the AUAR must be conducted to account for the potential cumulative impacts of the project on the environment (outside the project boundaries). Please include the complete final cumulative impacts analysis – either under Item #29 or specifically identified as a line item as part of the responses to other appropriate items within the AUAR.

At a minimum, it is expected that the direct and indirect impacts of the proposed project would be identified, along with the affected resources, ecosystems or human communities. Additionally, the project should be reviewed in temporal context to its operation and impact on the surrounding area. It is noted that several of the evaluations conducted for the AUAR include future impact projections (e.g., water supply, traffic, etc.). Where possible, the MPCA requests that this type of analysis be applied to address cumulative impacts to the surrounding area.

This comment letter addresses matters of concern to MPCA staff reviewing the AUAR and is submitted for consideration to the city of Mankato, the responsible governmental unit, in preparing the updated AUAR on the project. We look forward to receiving the required responses to our comments, and your decision on the need for further evaluation. If you have any questions regarding our comment letter, please contact me at (651) 297-1788.

Sincerely,



James E. Sullivan
Project Manager
Operations and Environmental Review Section
Regional Environmental Management Division

JES:gs

cc: Richard Newquist, MPCA, Regional Environmental Management Division, Operations and
Environmental Review Section
Larry Zdon, MPCA, Regional Environmental Management Division, Southeast Region
Gregg Downing, EQB/Saint Paul
Robert Roche, Assistant Attorney General

APPENDIX H.
Response to Comments

INTRODUCTION

Response to Comments

Notice of the Alternative Urbanwide Area Review (AUAR) for the Northeast Industrial Service Area was published in the EQB Monitor on July 4, 2005. The 30-day comment period ended August 3, 2005. During the comment period, two comments were received:

1. James Sullivan, Operations and Environmental Review Section, Minnesota Pollution Control Agency
2. Matt Langan, Division of Ecological Resources, Minnesota Department of Natural Resources

We would like to thank those who took the time to review the AUAR for the Northeast Industrial Services Area (Project) and for submitting comments. This memo addresses the comments made to the City of Mankato (City) concerning the Project. The questions and comments received, along with these responses, will be included as part of the environmental review documents.

According to MN Rules 4410, Chapter 4410.3610, Subpt 5, Procedures for Review, comments made must address the accuracy and completeness of the information provided in the draft analysis, potential impacts that warrant further analysis, further information that may be required in order to secure permits for specific projects in the future, and mitigation measures or procedures necessary to prevent significant environmental impacts within the area when actual development occurs. The City shall revise the environmental analysis document based on comments received during the comment period. The City shall include in the document a section specifically responding to each timely, substantive comment received that indicates in what way the comment has been addressed. If the City believes a request for additional analysis is unreasonable, it may consult with the EQB chair before responding to the comment. The City has included in the document a plan for mitigation specifying the mitigation measures that will be imposed upon future development within the area in order to avoid or mitigate potential environmental impacts. The plan contains a description of how each mitigation measure will be implemented, including a description of the involvement of other agencies, if appropriate.

After all comments have been addressed, the City will distribute the revised environmental analysis document in the same manner as the draft document and also to any persons who commented on the draft document and to the EQB staff. State agencies have ten days from the date of receipt of the revised document to file an objection to the document with the City of Mankato. A copy of any letter of objection must also be filed with the EQB staff. An objection may be filed only if the agency filing the objection has evidence that the revised document contains inaccurate or incomplete information relevant to the identification and mitigation of potentially significant environmental impacts or that the proposed plan for mitigation will be inadequate to prevent potentially significant environmental impacts from occurring.

Unless an objection is filed, the City will adopt the revised environmental analysis document and the plan for mitigation at its first regularly scheduled meeting held 15 or more days after the distribution of the revised document at the September 12th City Council Meeting. In general, three areas of concern were identified in the comments:

1. Wetland protection,
2. Open space designation, and
3. Cumulative overview of Project impacts.

RESPONSE TO COMMENTS ON THE AUAR

1. **Mat Langan, Environmental Planner, Division of Ecological Services, Minnesota Department of Natural Resources**

(Comments received via fax Wednesday, August 3, 2005)

The Department of Natural Resources (DNR) has reviewed the Northeast Industrial Services Area Draft Alternative Urban Areawide Review (AUAR). We offer the following comments for your consideration.

General Comments

In reviewing the AUAR, DNR's primary concern is the capability of Subsection G to be developed. DNR recommends that the City consider designating Subsection G for open space use instead of Subsection D. At a minimum, the City should require a formal wetland delineation of Subsection G before proceeding with development of a final AUAR, so that the delineation can inform decision-making.

In cross-referencing Item 10 (Cover Types, pages 11-15) with Exhibit G, it is apparent that the majority of the west edge of Subsection G is wetland. Going to the east side of this subsection, the text indicates that the mesic scrub/shrubland is dominated by hydrophytic vegetation (reed canary grass, red-osier dogwood, gray dogwood, green ash, sandbar willow, and sedges), and Exhibit I indicates this area contains Hydric soils as well; therefore much of this area is likely jurisdictional wetland. The text for the mixed mesic deciduous woodland also indicates that there is wetland interspersed there, and the text describes relatively good quality native woodland. Therefore, with the wetlands intermixed in these two habitats, it seems the eastern part of Subsection G will be difficult to develop as well. This leaves only the degraded western woodland area and the central "mesic and dry introduced short grass and legumes" area available for development. However, even the descriptor for the short grass and legume area indicates moist soil conditions and a prevalence of reed canary grass, and Exhibit I shows Hydric soils there, so even much of that area has the potential to be wetland and undevelopable, especially if 16.5 foot buffers are also incorporated around the wetland. Add to this Exhibit E₂ which shows the Alliance and Dome Pipelines crossing this parcel, and Exhibit M showing this area to be outside of the sanitary sewer service boundary, it seems much more appropriate that this area should be set aside as open space, instead of Subsection D. Page 20 of the AUAR indicates that wetland replacement for any project impacts could include "construction of wetlands in an upland area of the Project," and indeed Wetlands Conservation Act (WCA) requires this before replacement through an off-site wetland bank can be authorized. Therefore, consideration could be given to creating a project-specific wetland bank within Subsection G.

To address the DNR's primary concern with the capability of Subsection G to be developed thereby substituting the open space in subsection D to Subsection G, the city has shown industrial land use for all parcels with a 'Potential Sensitive Resource Area' overlay zone. It is assumed that approximately one-third of the total acreage of the three areas combined, or approximately 54 acres, will be set aside for wetland preservation, road improvements, regional stormwater facilities, and/or wetland mitigation area. The City realizes the development challenges associated with these subsections and knows the parcels specifically in Subsection C and G are not the most desirable for industrial development. However, during

the AUAR process, a 'worst case scenario' landuse plan was used to determine the most significant impacts associated with development. The majority of Subsection G appears to be wetland and therefore would not be available for development, which may not have been completely addressed in the Draft AUAR. However, industrial development was assigned to this parcel in order to study transportation, wetland, and other environmental impacts. The City also requires a formal wetland delineation be conducted, submitted, and approved prior to starting the preliminary platting process occurs throughout all portions of the City. The City does not believe a formal wetland delineation is necessary before the Final AUAR is distributed. When there is development interest in a specific parcel and if a formal wetland delineation defines an area which would allow for industrial development (after meeting all requirements and setbacks of WCA and City ordinance), then the City would allow the development.

The City is aware that in order for the AUAR to remain valid as a substitute form of review, the environmental analysis document and the plan for mitigation must be revised if five years have passed since the City adopted the original environmental analysis document and plan for mitigation. Since the projected timeline for the extension of CSAH 12 is greater than 5 years and is only in the conceptual stage of planning, the City is aware this AUAR document will most likely need to be updated.

Language has been added to the AUAR to reflect the statements above, specifically in Item 6. Descriptions and Item 9. Land Use.

Exhibit E₁ and Exhibit E₂ have also been revised. Based on feedback received from the DNR, areas C, D and G have been revised in the AUAR report and on Exhibit E₁ and Exhibit E₂. One thing to note, when the land use plan identifies a certain type of development in an area, this does not warrant permission from the City allowing development throughout the entire area. Exhibit E outlines a land use plan, not a rule or ordinance for development scenarios. Within these development scenarios, the City reserves the right to set aside space as natural areas, wetland preservation areas, potential wetland mitigation area, and/or public open space. Exhibit E₁ and E₂ have been revised to show this change. Each subsection may also include development in the future, which is also reflected in the exhibits.

Specific Comments

Fish and Wildlife and Ecologically Sensitive Resources (Item 11a, pages 15-18).

The larger and higher quality woodlands and scrub-shrublands within the AUAR area, that are not dominated by exotic species, are likely to support a diverse array of breeding neotropical migrants, a category of birds in which many populations are in decline. Conversely, the native grasslands (but not the grasslands dominated by brome or reed canary grass) are likely to support a variety of grassland birds such as meadowlarks, sedge wrens, and field sparrows. Many grassland birds are also experiencing sharp population declines. This is another reason the DNR recommends preserving Subsection G as open space rather than Subsection D.

Areas of possible native grasslands are very small with grasslands mainly dominated by brome and canary grass. It is the City's desire to work with the landowner to create an easement for the wetland and woodland complex within section G to protect this habitat and species. The City would like to prohibit

development within this area, but does not have the ability to force the land owner to put this area into easement.

The AUAR describes the City's intent to preserve a large emergent wetland in Subsection I. While DNR supports this intention, the AUAR text does not include a discussion of the protections afforded wetlands by WCA sequencing provisions. Before any wetlands can be impacted, every effort must be made to avoid the wetland impact. If avoidance is not possible, the wetland impact must be minimized to the maximum extent practicable. Only after avoidance and minimization have been addressed is replacement of impacts allowed. The City should consider the sequencing requirements of WCA as it decides how reasonable development of the project area should proceed. Again, DNR is primarily concerned about the feasibility of developing Subsection G, and Subsection C as well.

The Draft AUAR did not extensively discuss sequencing provisions, but did state that WCA laws will be followed, in which sequencing is required. Language has been included in the Final AUAR and includes a discussion of the protections afforded wetlands by WCA sequencing provisions. The City has previously considered sequencing requirements of WCA when it decides how reasonable development of an area will proceed. All wetland areas within the City of Mankato will be in accordance with the Wetland Conservation Act Rule 8420.0520 Sequencing. All sequencing requirements must be satisfied prior to the City's approval of any wetland impacts or wetland replacement plans. Proper sequencing implies that all attempts to avoid wetland impacts, both direct and indirect, have been considered. If avoidance of impacts can not be accomplished, then the wetland impacts must be minimized by limiting activities within the wetland to the maximum feasible extent. All unavoidable wetland impacts must then be replaced by wetland restoration, wetland creation, or the purchasing of credits from a wetland bank account. Wetland replacement for impacts within the City of Mankato has a minimum ratio of 2:1 (New Wetland Credit + Public Value Credit: Impacted Wetland Area). Section 404 of the Clean Water Act authorizes the Army Corps of Engineers to issue permits for wetlands under their jurisdiction. The Army Corps of Engineers will require the same sequencing standards as listed above. However, wetland impacts will require a wetland replacement of 1.5:1 (Replacement wetland area – New Wetland Credit: Impacted wetland area).

The AUAR also describes the potential for wildlife displacement. A common misconception is that wildlife will be relocated to other areas as the AUAR suggests. Habitat is usually saturated (ie at carrying capacity) for most wildlife species if populations are in balance. In fact, it is more likely that wildlife impacts will be greater than presumed as displaced animals will put stress on neighboring established animals as the displaced individuals disperse. The dispersing animals are more likely to suffer increased mortality or not become part of the breeding population than they are to find a vacant territory and reproduce.

Most natural areas currently in existence will remain intact because most of the Project area has previously been disturbed by agricultural practices. However, the recommended language stated in your letter has been included in item 11. Fish, wildlife and ecologically sensitive resources.

The proposed mitigation measures for wildlife impacts are sound measures. However, the first measure, if fully implemented, would seem to make subsection G largely

undevelopable. Since the AUAR proposes to develop Subsection G, DNR questions how this mitigation measure would be implemented. Again, DNR believes designating Subsection G as open space and reserving it for wetland mitigation and stormwater control would be more beneficial.

As stated earlier, the City will be working with property owners to protect existing natural habitat areas (including woodland, wetland, and open water) with conservation easements placed on sections of properties to protect the area for habitat and wildlife. Future open space designation may be applied to Subsection C, D and/or G.

Physical Impacts on Water Resources (item 12, pp. 18-20).

The first paragraph on page 19 indicates that a Mankato city ordinance will prohibit wetland filling and dredging, and will implement a 16.5-foot buffer around existing wetlands. However, other paragraphs in this section and other sections of the AUAR imply there may be some wetland filling and replacement. This appears to be conflicting information. DNR anticipates that there will be some wetland filling and replacement, and that it will be in compliance with the sequencing principles of WCA and Section 404 of the federal Clean Water Act. The final AUAR should demonstrate how the land will comply with sequencing requirements. One way to do so is not to develop in areas that require substantial filling of wetlands.

Currently, there are no plans for dredging, filling, stream diversions, diking of any surface waters such as a lake, pond, wetland, stream or drainage ditch. However, once development begins, it is anticipated that there will be some wetland filling and replacement. A detailed wetland investigation will be completed according to the criteria set forth in the Army Corps of Engineers 1987 Manual for all areas before development occurs at the Project site. The results of the investigation will be submitted to the City of Mankato for review. Wetlands found on the site through the investigation will be handled in accordance to the 1991 Minnesota Wetland Conservation Act (WCA) and the Clean Water Act Section 404 administered by the Army Corps of Engineers. Language in Item 12. Physical Impacts on Water Resources has been adjusted based on recommendations provided.

This section further reiterates that wetlands have not yet been identified based on official wetland delineations. For most Subsections, that should not be a problem. However, DNR recommends that official delineations be accomplished for at least Subsection G, if not all the Subsections. Such delineations can only help to inform decision-making.

All areas within the Project boundary will have a wetland investigation completed, submitted, and approved before any development will occur. As stated earlier, the City does not believe a formal wetland delineation is necessary before the Final AUAR is distributed.

Consideration should be given to restoration of the degraded type-3 wetland in Subsection C for partial wetland mitigation credit.

The City appreciates the DNR's recommendations. The City has considered this and will be looking into this option in the future before development in the area begins as a potential wetland mitigation option.

The last paragraph on page 19 indicates there are five identified wetland basins in Subsection G, based on NWI maps. However, based on the vegetation descriptions in Item 10, DNR believes there are more than five wetland basins in Subsection G.

The five identified wetland basins are based on NWI maps. The AUAR used the NWI as a basis for wetland area and does not consider the NWI to be accurate in terms of boundary and total wetland acreage for the Project area. A formal wetland investigation will be completed, submitted, and approved to determine actual wetland areas for each individual development project prior to preliminary plat.

The last paragraph on page 20 indicates that wetland mitigation (replacement) will be accomplished through either purchase of wetland banking credits or on-site wetland creation. The City should be aware that WCA allows off-site wetland bank replacement only if on-site replacement is not practicable. In this case, on-site replacement seems feasible. Therefore, off-site banking is unlikely to be allowed.

Draft Mitigation Plan I.A.1.a (p. 58).

Other text in the AUAR indicates there is a 16.5-foot setback from wetlands. Is this setback distance proposed to be increased or decreased? A decrease in setbacks would not be 'mitigation.' Some other Local Government Units in the state have setback requirements of 25, 33, or 50 feet. Increasing the setbacks would constitute "mitigation."

The following language will be included:

The City will ask our citizen environmental committee to take this topic under consideration and provide us with a wetland buffer recommendation and plan based on your comments. However, please be aware that the majority of the project area is currently being utilized for agricultural crop production. The Wetland Conservation Act provides incentive to restoring wetlands impacted by agricultural activities and the City will continue to encourage this activity.

Draft Mitigation Plan I.A.1.b (p. 58).

Such guidelines already exist in WCA, as well as in Section 404 of the Clean Water Act (ie, the "404(b)(1) guidelines"). The AUAR should simply assure that the proposed development of the site complies with the existing guidelines.

The wording in Draft Mitigation Plan 1.A.1.b (p. 58) will change from:

b) Develop guidelines for mitigation impacts, to:

Guidelines currently exist for wetland mitigation according to the WCA and Section 404 of the Clean Water Act. The Project will comply with these guidelines.

Currently, the City does not have mitigation or preservation efforts for woodland or native upland area. The City does have a ravine protection plan and the citizen environmental committee has woodland protection plans under consideration. The City will ask the citizen environmental committee to consider native prairie preservation plans and provide recommendations.

Draft Mitigation Plan I.B.1.a and d. (p. 59).

What is the intent of the wetland mitigation items? Please clarify.

Wording in this section will be restated to read:

Draft Mitigation Plan 1.B.1.a

Wetland investigations are required to be performed according to the Corps of Engineers Wetland Delineation Manual. All wetland investigations are required to be submitted to the city for approval. All wetland approvals and permits are required to be obtained before preliminary plat.

Draft Mitigation Plan 1.B.1.d.

Applicable wetland permits are required to be submitted and approved to obtain authorization for wetland alterations under WCA and Section 404 prior to project construction if development activities will impact a jurisdictional wetlands.

Draft Mitigation Plan 1.B.1.c. (p. 59).

The AUAR process should determine which Subsections can be reasonably developed with little or no wetland impact. If a Subsection cannot be developed without wetland impacts, the proposed use of the Subsection should be modified through the AUAR process, rather than deferred until later.

The City did not use AUAR process to evaluate the potential for development of each parcel of property, but rather to identify the environmental impacts associated with the 'worst-case scenario' for certain land use developments. The Draft AUAR did not completely outline the intentions of the City regarding wetland issues, and language has been added to the AUAR regarding wetland investigations, permitting and mitigation. Even if portions of a subsection cannot be developed because of potential wetland impacts, this does not mean the entire subsection is unavailable for development. Subsection G is categorized as 'industrial land use' but this does not mean the entire area will be developed. All areas will need to meet wetland guidelines, along with all other City ordinances. As you can see in the traffic study and the approximate land use values used, Subsection G was known to have large wetland complexes with undevelopable areas. Obviously, all 80 acres within the parcel will not allow development and as stated earlier, this projection was used to estimate a 'worst-case scenario' development plan. As part of the traffic, air and noise analysis projections, build-out of Subsection G was forecasted at 50% for the 2025 analysis.

As stated earlier, the City is aware that in order for the AUAR to remain valid as a substitute form of review, the environmental analysis document and the plan for mitigation must be revised if five years have passed since the City adopted the original environmental analysis document and plan for mitigation. Since the projected timeline for the extension of CSAH 12 is greater than 5 years and is only in the conceptual stage of planning, the City is aware this AUAR document will most likely need to be updated.

Exhibit E₁ and Exhibit E₂ have also been revised. In addition, the land use plan maps only show a type of land use for the area—it does not warrant permission from the City to allow development throughout the entire area. Exhibit E outlines a plan, not a rule or ordinance for development within each area. Within these development scenarios, the City reserves the right to set aside areas as natural areas, wetland preservation areas, potential wetland mitigation area, and public open space. Exhibit E₁ and E₂ have been revised to show this change. Each

subsection may also include development in the future, which is also reflected in the exhibits.

Thank you for the opportunity to review this document. We look forward to receiving your Final AUAR and Mitigation Plan at a future date. Please contact me at 651-297-3359 if you have questions regarding this letter.

2. James Sullivan, Project Manager, Operations and Environmental Review Section, Regional Environmental Management Division, Minnesota Pollution Control Agency
(Comments received via fax Wednesday, August 3, 2005)

The Alternative Urban Areawide Review (AUAR) for the City of Mankato Northeast Industrial Service has been reviewed by the Minnesota Pollution Control Agency (MPCA) staff. This comment letter addresses matters of concern to MPCA staff reviewing the AUAR and is submitted for consideration by the city of Mankato (City). This letter does not constitute approval by the MPCA of any or all elements of the project for the purpose of pending or future permit action(s) by the MPCA. We have attempted to identify and consult with interested program staff to identify the MPCA permits that may be required. Additional comments or requests for information may be submitted in the future to address specific issues related to the development of such permit(s). Ultimately, it is the responsibility of the project proposer to secure any required permits and to comply with any requisite permit conditions.

Table 8-1 in the draft AUAR indicates the types of permits and approvals required for the development and that an Army Corps of Engineers Section 404 permit is required for this project. Item 8 also indicates that an MPCA 401 Certification will be required. Since the MPCA is waiving 401 certifications, we recommend the following language be included in the AUAR to accurately inform any reviewers of the status of MPCA's 401 reviews and determinations:

The MPCA is limited to waiving many Section 401 certification applications with exceptions. Applications for 401 certifications must still be sent to the MPCA as they have been in the past. In most cases, MPCA's decision will be to issue a waiver but the MPCA reserves the right and authority to proceed differently if extreme or unique circumstances merit a different approach. The waiver of 401 certifications means that the MPCA has not reviewed the proposed federal permit application for conformance with the state water quality standards and requirements as contained in Minn. R. 7050 and all other applicable state rules regarding water quality. In the event of water quality violations caused by the applicant's project, enforcement action may be taken by the MPCA.

Thank you for the information. The AUAR will include this wording to accurately inform any reviewers of the status of MPCA's 410 reviews and determinations in Item 8. Permits and Approvals Required.

Table 8 indicates the permits and approvals that would be applied for regarding wetland filling or draining; that is to the Corps of Engineers 404 program and to the Local Unit of Government under the Wetland Conservation Act. However, item 12 indicates "There will be no dredging, filling, stream diversions, diking of any surface waters..." and then in the mitigation discussion of item 12 it indicates that "Any wetland impacts involved with the development of the Project will be administered in accordance with the Minnesota Wetland

Conservation Act and Section 404 of the Clean Water Act...” These statements appear to conflict. The expectation of wetland filling, draining, excavation or inundation should be quantified and located on the site layout in respect to proposed development in order to access the potential for environmental impact through this AUAR. Also, a reasonable proposal for compensatory wetland replacement for the proposed wetland impact should demonstrate that the anticipated impact can be mitigated for on site or however, proposed.

Currently, there are no plans for dredging, filling, stream diversions, diking of any surface waters such as a lake, pond, wetland, stream or drainage ditch. However, once development begins, it is anticipated that there will be some filling to jurisdictional wetlands and replacement. A detailed wetland investigation will be completed according to the criteria set forth in the Army Corps of Engineers 1987 Manual for all areas before development occurs at the Project site. The results of the investigation will be submitted to the City of Mankato for review. Wetlands found on the site through the investigation will be handled in accordance to the 1991 Minnesota Wetland Conservation Act (WCA) and the Clean Water Act Section 404 administered by the Army Corps of Engineers. Language in Item 12. Physical Impacts on Water Resources, has been adjusted based on recommendations provided.

A proposal for compensatory wetland replacement is premature when facilities are conceptual in design and it is unknown whether wetlands will even be impacted. The City does not believe a formal wetland investigation is necessary before the Final AUAR is distributed. The City currently requires wetland investigations be submitted, permitted for, and approved prior to the preliminary plat.

Item 12 of the AUAR indicates that the local ordinance requires a 16.5 foot setback for structures and impervious surfaces for the delineated edge of the wetlands. The document does not discuss any proposed protections to the wetlands such as buffers. The MPCA supports a requirement that adequate natural buffers be included surrounding the wetlands. At a minimum, these buffers should be in the 20-50 foot range with more buffer dependant on the protection goals. The buffer of native vegetation needs to be perpetually maintained around the wetlands and we recommend the city prohibit the alteration of natural vegetation within the buffer strip. Conservation easements, covenants, recorded deed restriction or other permanent restrictions have been used to prohibit lot owners from filling or altering wetlands and or buffers on their lots, however, enforcing the buffer restriction on each of the individual lot owners can be burdensome and difficult if lot owners desire to mow these areas to expand their back yard. We recommend the wetland boundary and an appropriate buffer be designated public property under the city's management to assure the maintenance of the buffer and to avoid the difficulties of enforcing these restrictions on individual lot owners in the future.

The City requires that all structures be constructed at least 16.5 feet away from wetland boundaries. This area is not considered a buffer area and can be mowed. However, this is more restrictive than the Wetland Conservation Act and the Clean Water Act and therefore the City considers this setback mitigation. The Board of Soil and Water Resources has also approved of Mankato's wetland rules and regulations for many projects in the past. Also to clarify, there is no residential land use associated with this Project, therefore the desire of 'lot owners' to mow these [wetland setback] areas to expand their 'back yard' is unlikely.

The City will consider your recommendation to extend this distance and reclassify it as a buffer area maintained in its natural state. The City is aware of other communities that have buffer area restrictions around wetlands. The City will ask our citizen environmental committee to take this topic under consideration and provide us with a wetland buffer recommendation and plan based on your comments. However, please be aware that the majority of the project area is currently being utilized for agricultural crop production. Wetlands located within the cropped areas do not have any natural vegetation remaining and would need to be restored. The Wetland Conservation Act provides incentive to restoring wetlands impacted by agricultural activities and the City will continue to encourage this activity.

As part of requiring resolution of all wetland related issues prior to preliminary plat, the City requires that land owners and developers submit an application for a No-Loss certificate for all wetland areas that will not be indirectly impacted by the development of the property. A hydrology study must be submitted with this application providing evidence that wetland will continue to have hydrology sufficient retain wetland quality.

The document does not describe if any type of impact to the wetlands may occur in response to the construction and operation of storm ponds. It should be noted that MN Rule 7050 requires the protection of all wetlands that are considered "waters of the state" as defined in Minn. Stat.115.01 subd.22. It should be noted that the wetland impacts that may be considered non jurisdictional or exempted from the CWA 404 program or WCA may still be regulated by the MPCA. For example, any existing wetlands that are altered by excavation or other construction to function as stormwater retention basins should be considered to be adversely impacted and evaluated under the sequence mitigation requirements of water quality standards in MN Rule 7050.0186 and the NPDES permit. The requirement in water quality standards to avoid, minimize or mitigate wetland impacts must be satisfied in all MPCA NPDES/SDS permits, including the issuance of the general Construction Storm Water (CSW) NPDES permits. If a project involves altering a wetland by draining, filling, excavation or inundating and the impact is not addressed (mitigated) by either the U.S. Army Corps of Engineers Section 404 program, Minnesota Department of Natural Resources, or the State of Minnesota Wetland Conservation Act permits or other determinations then the project proposer must demonstrate compliance with the mitigation requirements of MN Rule 7050.0186. For the purposes of the MPCA CSW NPDES permit, de minimus determinations by another permitting agency that address the project impacts are recognized by the MPCA and additional mitigation is required. However, a non-jurisdiction determination by another permitting agency does not address project impacts and therefore does require the project proposer to demonstrate mitigation to meet NPDES permit conditions and MN Rule 7050.0186.

The AUAR has been prepared as a master plan for development. Because the location of stormwater plans is conceptual, it is unknown whether or not these facilities will impact wetland area. As stated earlier, a proposal for compensatory wetland replacement is premature when facilities are conceptual in design and it is unknown whether wetlands will even be impacted. As a matter of policy, the City believes that the construction and stormwater ponds can and will avoid wetland impacts.

MPCA staff note that some municipalities have designed their entire storm-sewer system using wetlands as the discharge point. Cases also exist where numerous isolated wetland

basins were artificially connected via a storm-sewer network creating a “flow through” system where none existed previously. Use of wetlands for such storm-water purposes is often justified by the proposer on basis of cost savings, convenience, or ease of construction, since many of the wetlands are topographic depressions. However, the exclusive exploitation of a single wetland function, such as stormwater retention, is likely to degrade the other functions of the wetland and, therefore, cause degradation of the multiple function and multiple values of the designated use of that wetland. A local community may place more public value on a single function of a wetland such as stormwater retention, however, that single value emphasis should not distort the application of designated use to a single function to the detriment of the multiple functions that the natural wetland provides.

The City views the construction of stormwater ponds in wetland areas as critically as any other construction activity in wetlands. The City considers this activity a wetland impact and is not allowed without proceeding through the Wetland Conservation Act permit application and sequencing procedures.

Another concern identified within the AUAR is the discussion of cumulative impacts found in item #29. The MPCA has noticed that a number of governmental units coordinating and developing an AUAR do not conduct a cumulative impact assessment, relying on the first portion of the Environmental Quality Board guidance as justification for eliminating the cumulative impacts analysis:

“This item does not require a response for an AUAR since the entire AUAR process deals with cumulative impacts for related developments within the AUAR area.”

The complete AUAR guidance¹ reads as follows:

This item does not require a response for an AUAR with respect to cumulative impacts of potential development within the AUAR boundaries, since the entire AUAR process is intended to deal with cumulative impacts from related developments within [Italics added] the AUAR area; it is presumed that the responses to all items on the EAW form encompass the impacts from all anticipated developments within the AUAR area.

However, the questions of this item should be answered with respect to the cumulative impacts of development within the AUAR boundaries combined with past, present, and reasonably foreseeable future projects outside [Italics added] of the AUAR area, where such cumulative impacts may be potentially significant. (As stated on the EAW form, these cumulative impact descriptions may be provided as part of the responses to other appropriate EAW items, or in response to this item).

Based on MPCA staff review, the existing AUAR does not currently provide sufficient analysis of the potential cumulative impact issue either within or outside the boundaries of the project area in light of the current EQB AUAR guidance. The cumulative impact assessment within the boundaries of the project area does not appear to be explicitly addressed within the confines of the AUAR (e.g., specifically identified as “Cumulative Impact” within any of the AUAR Items), nor is a discussion of potential cumulative impacts to areas outside the boundaries of the project area. The City has recognized that there will be

¹ Environmental Quality Board, (2004). Recommended Content and Format – Alternative Urban and Areawide Review Documents. <http://www.egb.state.mn.us/pdf/AUARformat2a-rev%205-041.pdf>. [November 23, 2004]

modifications to the future landscape as part of the project, however, little is provided in support of this discussion. The MPCA recognizes that the manner in which the cumulative impacts assessment is conducted is a function of City financial and information resources. A variety of methods exist in which a cost-effective analysis could be conducted that would aid in the AUAR decision-making process. Clearly, not all environmental, social or economical media lend themselves to an effective quantitative analysis. In the absence of method or information to conduct a quantitative cumulative impact assessment, qualitative methods will suffice.

Fortunately, much of the information needed for the completion of the cumulative impact evaluation of this project is likely already in existence. Some of the analytical work already conducted for the AUAR can be used to develop the cumulative impacts analysis within the project boundaries. Either a separate analysis or an adapted analysis within the framework of the AUAR must be conducted to account for the potential cumulative impacts of the project on the environment (outside the project boundaries). Please include the complete final cumulative impact analysis – either under item #29 or specifically identified as a line item as part of the responses to other appropriate items within the AUAR.

At a minimum, it is expected that the direct and indirect impacts of the proposed project would be identified, along with the affected resources, ecosystems or human communities. Additionally, the project should be reviewed in temporal context to its operation and impacts on the surrounding area. It is noted that several of the evaluations conducted for the AUAR include future impact projections (e.g., water supply, traffic, ect..). Where possible, the MPCA requests that this type of analysis be applied to address cumulative impacts to the surrounding area.

It is the City of Mankato's standing that the existing AUAR currently provides sufficient analysis of the potential cumulative impact issues within and outside the boundaries of the Project area in light of the current EQB AUAR guidance. As quoted above and as stated on the EAW form, 'these cumulative impact descriptions may be provided as part of the response to other appropriate EAW items, or in response to this item instead of repeating the cumulative impacts that have been outlined in this report.' The entire AUAR process is intended to deal with cumulative impacts from related developments within the AUAR area—all items in the AUAR encompass the impacts from anticipated developments within the AUAR area. The AUAR was prepared by including the cumulative impact descriptions as part of the responses to the appropriate items. The cumulative answer provided in Item 29 was above and beyond the cumulative language throughout the AUAR. In addition to the cumulative language given in the items, the AUAR also addresses the cumulative effects associated with sprawl and suburbanization and the loss of open space and rural areas. The AUAR states:

One area this AUAR does not address in previous items is the cumulative effects associated with sprawl and suburbanization. This can have both positive and negative cumulative effects socially and environmentally. Determining the full effect of cumulative impacts is more intuitive than quantifiable. Some of the cumulative effects that can be observed from the expansion of this Project are loss of agricultural land, loss of open space, fragmentation of wildlife habitat, and loss of a rural sense of place.

There is a competing issue with the goals of many communities in balancing development with agricultural needs, open space, and natural resources while trying to retain a sense of place. Sprawl has become an issue in many areas and is only becoming a larger issue because of the need to preserve natural areas and open space. Through these competing issues, many environmental resources, former open spaces and farmland have decreased and infrastructure costs of roads and sewer system extensions have increased.

The City understands how important rural areas and agricultural practices are, not only to the character of the area, but to the vitality of our economy. The City is trying to take reasonable steps to ensure the rural and agricultural quality of like and to preserved agricultural land, open space, and wildlife habitat while also trying to take a responsible approach to urban development. In consideration of the City's growth projections and landuse goals, the Project is consistent with the Comprehensive Plan. Blue Earth County also has controls to promote development where it can be sustained with public infrastructure services. This, in turn, protects the environment and deters fragmentation of agricultural areas by non-agricultural land uses.

As explained in each item of the AUAR, the cumulative impacts are reiterated here, combined with a greater detail and with respect to the cumulative impacts of development within the AUAR boundaries combined with the past, present, and reasonable foreseeable future projects outside the AUAR area as requested by the MPCA. This language has been included in Item 29 of the Final AUAR report.

The city of Mankato is a very proactive community in terms of cumulative impacts in comparison to surrounding towns and other similar-sized cities in the State. The city of Mankato is a regional hub for most of the south and southcentral portions of Minnesota. Mankato has experienced significant growth since the town was established, especially through the 1970s-80s. Mankato has used a proactive approach to development in order to decrease the negative cumulative effects to the environment and population of the area which can stem from a reactive approach to infrastructure planning and development.

Infrastructure and cumulative impact assessments have previously been completed for Mankato, therefore, only minor mitigation efforts are shown in the AUAR. Mankato has laid the framework for this Project specifically, taking into account the cumulative effects of development in the Project boundary and in the Project area in order to plan for future and current infrastructure projects.

Transportation Impacts

Consideration of direct, indirect, and cumulative impacts (or effects) of a development is important considering the increase in traffic and public transportation infrastructure. While direct impacts are easier to identify, indirect and cumulative impacts are more difficult. Direct impacts are caused by the action and occur at the same time and place as a specific project. Indirect impacts are associated with a project and occur later in time or farther removed in distance; but they are still reasonably foreseeable such as induced land development from highway projects. Cumulative impacts, on the other hand, result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable actions,

regardless of the agency or person initiating the other actions. Where indirect impacts are specifically related to a transportation project and can occur from induced development, cumulative impacts are the result of other present and future development actions.

The City of Mankato has taken many steps to plan for the cumulative impacts associated with the transportation system. A planning study called the Mankato Area Transportation and Planning Study (MATAPS) was completed in 1996 after the first studies were undertaken in the early 1970s by six governmental agencies: MnDOT, Blue Earth County, Nicollet County, the City of Mankato, the City of North Mankato, and the Region Nine Development Commission. This partnership provided a platform from which long-range regional and cumulative impacts, goals and policies were developed. Further, the AUAR has addressed both direct and indirect transportation issues through a detailed air, noise and traffic analysis completed by SRF Consulting.

To address additional cumulative impacts related to transportation and traffic, the need for an AUAR for this Project area is the cumulative result of upgrades to Hwy 14 occurring from Nicollet to Rochester. Hwy 14 is in the process of becoming a 4-lane road, and has seen an increase in traffic over the last years. The improvements to the Hwy 14 transportation system has appealed to industrial, commercial, and manufacturing business that utilize the roadway system. The area around the Project has seen rapid development as a result of these improvements. The City of Mankato is using the AUAR process to gain a better understanding of the environmental impacts associated with the cumulative effects of growth in the area.

Open Space/Cover Types/Corridors Impacts

The City of Mankato created a Parks & Open Space Plan in September, 2002. This plan takes a cumulative approach and is used as a tool to provide recreational activities as well as preserve sensitive natural resources. The Plan helps the City to ensure that investments made to parks and open space in the future are part of a greater whole, a complex interrelated system of wetlands, woodlands, recreation fields, trails, playgrounds and parkways, connecting to each other.

In accordance with the Open Space Plan and as stated in the AUAR, the majority of natural areas will remain intact and will provide habitat for area wildlife in order to decrease the cumulative impacts associated with the loss of these areas. Because the Project includes mostly disturbed areas, corridor impacts from this project compared to predevelopment conditions is minor. The City and MnDOT plan to protect most of the natural areas through conservation easements wherever possible.

Ground Water Impacts

Over pumping of the water supply system can cause decline of ground water levels in aquifers, local impacts on streams and wetlands, and the potential of necessary groundwater resources be made unavailable for future use. Long-term effects of depleting groundwater may include depletion of wetlands, streams, springs, and lakes, as well as ecological or other changes.

In order to create a sustainable system of water supply for Mankato, a dynamic equilibrium is sought that approximately balances recharge, discharge, and withdrawals of groundwater.

The City of Mankato appropriates water from a combination of sources. One source includes multiple wells constructed into the Mt. Simon-Hinckley Aquifer, and the second source is a Ranney vertical caisson with horizontal collector lateral. Mt. Simon-Hinckley Aquifer is the deepest aquifer in the area and has limited recharge. This aquifer is protected for potable water purposes and restricts new uses. New uses are only allowed if there are no other alternatives and when conservation measures are being implemented. The City of Mankato is in the process of improving their water supply system with the addition of two new wells. Because of the protections to this aquifer, the City of Mankato (since the AUAR draft publication) has found alternative sources of water and has proposed to drill two wells into the Ranney vertical caisson with horizontal collector laterals instead of a well into the Mt. Simon-Hinckley Aquifer.

Horizontal wells are constructed by installing a vertical caisson into the ground, then pushing horizontal collector laterals out from the bottom of the caisson. In this type of well, the materials above the collector laterals remain undisturbed. Ranney Collectors are one type of horizontal well. Because they are typically shallow and located close to a surface water body with the intent of capturing water in alluvial aquifers, they are also considered a source of groundwater at risk from contamination by relatively large waterborne pathogens passing to the ground water collector from surface water. What this means, is that marginal water is utilized by the City for water supply and the water pumped and treated utilizing the facilities at the water treatment plant.

Water enters the plant at a hardness of four hundred and sixty parts per million gallons and is softened down to approximately one hundred and forty parts per million. The chemical used for the softening process is Lime. Coagulant chemicals are also utilized to assist the flocculation process. Phosphate, Fluoride, and Chlorine are also added to the water. The Water supply of Mankato is approved by the State of Minnesota and also by the Federal Government.

The city of Mankato has an ever-increasing need for water supply. In order to decrease negative cumulative impacts on surface and groundwater from general growth and population increases, the City is proposing to expand their horizontal collector lateral. Water from this source comes from horizontal collectors that run under the Minnesota River. The effects of growth and development on groundwater levels generally lag behind growth or development activities. For instance, as land is converted to urban use with storm sewers and paved surfaces or as drainage is redirected from wetlands to ditches for increased agricultural production, the patterns of ground water recharge are altered or interrupted. This decreases the amount of water that infiltrates into the ground to replenish the aquifers. Wetland restoration and preservation is one management technique that can be used to reduce the redirection of precipitation and surface water runoff that might otherwise have recharged the ground water. Safeguarding the natural recharge process in this manner can have a long-term positive influence on water supplies. This Project and the City of Mankato has taken a planned approach to growth that considers the

available water supply and water resource setting to minimize the cumulative impacts on both ground and surface water and human resources.

Sanitary Sewer Impacts

In order to create a sustainable system for Mankato, a dynamic equilibrium is sought that approximately balances recharge, discharge, and withdrawals of groundwater.

The city of Mankato has considered the cumulative impacts of wastewater treatment and has completed extensive master planning. The Wastewater Treatment Plant recently received an upgrade that greatly enhanced the quality of water entering the Minnesota River (the water entering the river is actually cleaner than the water pumped from water supply facilities) and is designed for use through the year 2020.

As stated in the AUAR, the City of Mankato is in partnership with Calpine Corporation who will be constructing and operating a new water reclamation facility adjacent to the City's existing WWTP. The effluent from the WWTP will enter Calpine's facility for additional treatment before being routed to Calpine's Mankato Energy Center, a power plant currently under construction. Calpine will use the reclaimed water for processing and cooling. Calpine's facility will be designed to provide two additional stages of treatment to wastewater. Surrounding cities, including Eagle Lake, are currently pumping their wastewater to the Mankato facilities, thereby decreasing the cumulative impacts of outlying areas by prohibiting less-treated wastewaters from entering waters of the State. Cumulatively, this helps protect habitat, wildlife, and human resources in the area, as well as downstream areas throughout the State.

Stormwater Impacts

The City of Mankato is located adjacent to the Minnesota River in Blue Earth County and can be divided into three main topographical regions. These regions are the flood plain of the Minnesota River, the steep bluff area, and the upland plain. The flood plain of the Minnesota River is the area where much of the original development of Mankato occurred. Most of the bluff area which can be developed has been developed. The vast majority of this steep bluff area will remain as open area. The upland plain is the area where much of the present development is occurring, including the AUAR area. The City experienced rapid growth in the 1970s and 1980s as a result of the expansion of the state university facilities and because the City of Mankato has become a commercial hub for the south and south-central region of Minnesota. In the upper plain above the Minnesota River bluff where the AUAR area is located, the land is extremely flat and the natural drainage pattern in some locations is difficult to determine. The drainage patterns within the AUAR area and outside the AUAR area drain into the Minnesota River via small tributary waterways.

Minnesota's lakes, rivers, wetlands and streams all depend on the replenishing waters of annual precipitation. However, when rain falls on land and impervious areas such as paved streets, parking lots and building rooftops it can wash away soil and sediment. Stormwater runoff from these surfaces can change both water quality and quantity affecting our water resources physically, chemically and biologically. The stormwater from within and outside the Project area will increase potentially having a negative effect on downstream waters. An increase in runoff also has the potential to overwhelm existing water systems including ravines, creeks, and rivers,

possibly leading to the destruction of habitat, erosion problems, downstream sediment deposits, and or an increase in nutrient levels.

The natural drainage patterns within the City of Mankato have already been disturbed by existing development. Existing storm drains, streets, road ditches, culverts, and other forms of urban development have made some diversions and concentrations of stormwater runoff. While most of this development has not had a serious adverse effect on the natural drainage pattern, the intensive development along the Minnesota River has created serious construction problems and increased the cost in providing adequate outlets for the major systems outside the AUAR area.

The City of Mankato has been very proactive in order to address cumulative impacts associated with stormwater and is currently in the process of updating its existing Stormwater Master Plan to include the mandated MS4 standards. The requirements of the Phase II MS4 program include: 1) Reduce the discharge of pollutants to the "maximum extent practicable", 2) Protect water quality; and 3) Satisfy the appropriate water quality requirements of the Clean Water Act. Minnesota regulates the disposal of stormwater through a combined NPDES/SPS permit and through the Municipal Separate Storm Sewer Systems (MS4s) program for applicable projects.

Mandated by Congress under the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Stormwater Program is a comprehensive national program for addressing polluted stormwater runoff. Minnesota regulates the disposal of stormwater through State Disposal System (SDS) permits. The MPCA issues combined NPDES/SDS permits for construction sites, industrial facilities and municipal separate storm sewer systems (MS4s).

As stated in the AUAR, the Minnesota Pollution Control Agency (MPCA) is in charge of reducing the pollution and damage caused by stormwater runoff. This designation was mandated by Congress under the Clean Water Act because of the pollution and damage caused by stormwater runoff. In 1990, the EPA promulgated rules establishing Phase I of the NPDES stormwater program. This program included regulations for MS4s to implement a stormwater management program to control polluted discharges. The Phase II rule extends coverage of this program to smaller municipalities and businesses and includes the City of Mankato.

Stormwater and drainage plans for cumulative impacts and master planning have been prepared for the City since the 1970s. According the Drainage Study prepared by Barr Engineering (1994) one concern in the preparation of all stormwater systems is to protect and preserve the existing ravines and creek valleys located within the City. Many alternatives are considered to provide protection to these ravines. One method provides storage in the upland areas in order to decrease flowrates, in other areas, diversions are made from one drainage area to another to decrease flowrates into the ravines, and a third method collects the stormwater from numerous small systems and outlets it at a single location where it is more economically feasible to provide the energy dissipation necessary to protect the ravines and creek valleys.

In addition, the City of Mankato has a Strategic Plan which is updated biannually and is used for planning and lays the framework for future development while identifying cumulative impacts. Overall, the City of Mankato is committed to seeking ways to improve and better manage stormwater runoff in an effort to improve the quality of

water going into the Minnesota River and to reduce negative cumulative impacts associated with runoff. To do this, the City closely monitors stormwater facilities to ensure they meet acceptable water quality standards. The City also has a strategy to keep citizens educated and informed about water quality issues, among numerous other planning and design activities to ensure the quality of water going into the River.

As stated in the AUAR, a cumulative approach for stormwater impacts utilizing a stormwater system and stormwater basins on-site will allow the majority of the stormwater runoff from this development to be treated. This treatment will remove sediment from the stormwater, enhance the quality of runoff off-site and outside the AUAR boundary, and will provide open space area for wildlife species. Regional stormwater ponds will also be utilized for further treatment to remove sediment. In addition, Barr Engineering is currently in cooperation with the City and is studying stormwater treatment for purposes of designing another large regional stormwater treatment basin in order to treat stormwater before entering the Minnesota River. Utilizing numerous treatment facilities helps prevent negative cumulative effects to the local population, the Minnesota River, local and regional habitat and wildlife, and downstream amenities.

This comment letter addresses matters of concern to MPCA staff reviewing the AUAR and is submitted for consideration to the city of Mankato, the responsible governmental unit, in responses to our comments, and your decision on the need for further evaluation. If you have any questions regarding our comment letter, please call me at (651) 297-1788.